

1-37

First draw a free-body diagram of the lower jaw, and write the equations of equilibrium

$$\rightarrow \Sigma F_x = 0: \quad -C_x = 0$$

$$\uparrow \Sigma F_y = 0: \quad D - C_y - E = 0$$

$$\curvearrowright \Sigma M_D = 0: \quad 3C_y - 2E = 0$$

$$C_x = 0$$

$$E = 1.5C_y$$

Next, from a free-body diagram of the lower handle, the equations of equilibrium give

$$\rightarrow \Sigma F_x = 0: \quad 0 - B_x = 0$$

$$\uparrow \Sigma F_y = 0: \quad 50 + C_y - B_y = 0$$

$$\curvearrowright \Sigma M_B = 0: \quad 1C_y - 20(50) = 0$$

$$C_y = 1000 \text{ lb}$$

$$B_x = 0 \text{ lb}$$

$$B_y = 1050 \text{ lb}$$

$$E = 1500 \text{ lb} \dots\dots\dots \text{Ans.}$$

