By vertical equilibrium (Fig. 7.5.3), the shears V equal:

$$V_4 = 3R_4 = \frac{3}{40}\left(\frac{h}{l}\right)W,$$

$$V_3 = 3R_3 - 3R_4 = \frac{12}{40}\left(\frac{h}{l}\right)W,$$

$$V_2 = 3R_2 - 3R_3 = \frac{24}{40}\left(\frac{h}{l}\right)W,$$

$$V_1 = 3R_1 - 3R_2 = \frac{36}{40}\left(\frac{h}{l}\right)W.$$

The thrusts H are obtained by rotational equilibrium about the beam hinges (Fig. 7.5.3):

$$H_4\frac{h}{2} - 3R_4\frac{l}{2} = 0 \quad \therefore \quad H_4 = 3\left(\frac{l}{h}\right)R_4 = \frac{3}{40}W,$$

$$H_3\frac{h}{2} + H_4\frac{h}{2} + 3R_4\frac{l}{2} - 3R_3\frac{l}{2} = 0$$

$$\therefore \quad H_3 = 3\left(\frac{l}{h}\right)(R_3 - R_4) - H_4 = \frac{9}{40}W,$$

$$H_2\frac{h}{2} + H_3\frac{h}{2} + 3R_3\frac{l}{2} - 3R_2\frac{l}{2} = 0$$

$$\therefore \quad H_2 = 3\left(\frac{l}{h}\right)(R_2 - R_3) - H_3 = \frac{15}{40}W,$$

$$H_1\frac{h}{2} + H_2\frac{h}{2} + 3R_2\frac{l}{2} - 3R_1\frac{l}{2} = 0$$

$$\therefore \quad H_1 = 3\left(\frac{l}{h}\right)(R_1 - R_2) - H_2 = \frac{21}{40}W,$$

and by horizontal equilibrium (Fig. 7.5.3):

$$H_0 - H_1 - \frac{W}{2} = 0 \quad \therefore \quad H_0 = H_1 + \frac{W}{2} = \frac{41}{40}W.$$

The thrusts H' are obtained by horizontal equilibrium from Fig. 7.5.3:

$$H'_4 + H_4 - \frac{W}{2} = 0 \quad \therefore \quad H'_4 = \frac{W}{2} - H_4 = \frac{17}{40}W,$$

$$H'_3 + H_3 - H_4 - W = 0 \quad \therefore \quad H'_3 = W - H_3 + H_4 = \frac{34}{40}W,$$

$$H'_2 + H_2 - H_3 - W = 0 \quad \therefore \quad H'_2 = W - H_2 + H_3 = \frac{34}{40}W,$$

$$H'_1 + H_1 - H_2 - W = 0 \quad \therefore \quad H'_1 = W - H_1 + H_2 = \frac{34}{40}W.$$