

Assuming all coordinates positive to the right and x_1 , x_2 , and x_3 associated with their respective masses the EOM for mass m_2 is:

$$m_2 \ddot{x}_2 - b_4 \dot{x}_1 + (b_2 + b_3 + b_4) \dot{x}_2 - b_3 \dot{x}_3 - k_4 x_1 + (k_2 + k_3 + k_4) x_2 - k_3 x_3 = 0$$