

$$\begin{bmatrix}
 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 -R_{12_y} & R_{12_x} & -R_{32_y} & R_{32_x} & 0 & 0 & 0 & 0 & 1 \\
 0 & 0 & -1 & 0 & 1 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & -1 & 0 & 1 & 0 & 0 & 0 \\
 0 & 0 & R_{23_y} & -R_{23_x} & -R_{43_y} & R_{43_x} & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & -1 & 0 & 1 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & -1 & 0 & 1 & 0 \\
 0 & 0 & 0 & 0 & R_{34_y} & -R_{34_x} & -R_{14_y} & R_{14_x} & 0
 \end{bmatrix}
 \times
 \begin{bmatrix}
 F_{12_x} \\
 F_{12_y} \\
 F_{32_x} \\
 F_{32_y} \\
 F_{43_x} \\
 F_{43_y} \\
 F_{14_x} \\
 F_{14_y} \\
 T_{12}
 \end{bmatrix}
 =$$

(11.9)

$$\begin{bmatrix}
 m_2 a_{G_2_x} \\
 m_2 a_{G_2_y} \\
 I_{G_2} \alpha_2 \\
 m_3 a_{G_3_x} - F_{P_x} \\
 m_3 a_{G_3_y} - F_{P_y} \\
 I_{G_3} \alpha_3 - R_{P_x} F_{P_y} + R_{P_y} F_{P_x} \\
 m_4 a_{G_4_x} \\
 m_4 a_{G_4_y} \\
 I_{G_4} \alpha_4 - T_4
 \end{bmatrix}$$