For spin $\frac{5}{2}$ system:

$$J_x = \begin{pmatrix} 0 & \frac{\sqrt{5}}{2} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{2} & 0 & \frac{\sqrt{2}}{1} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{1} & 0 & \frac{3}{2} & 0 & 0 \\ 0 & 0 & \frac{3}{2} & 0 & \frac{\sqrt{2}}{1} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{1} & 0 & \frac{\sqrt{5}}{2} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{2} & 0 \end{pmatrix} \tag{1}$$

$$J_y = \begin{pmatrix} 0 & -\frac{\sqrt{5}}{2}i & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{2}i & 0 & -\frac{\sqrt{2}}{1}i & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{1}i & 0 & -\frac{3}{2}i & 0 & 0 \\ 0 & 0 & \frac{3}{2}i & 0 & -\frac{\sqrt{2}}{1}i & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{1}i & 0 & -\frac{\sqrt{5}}{2}i \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{2}i & 0 \end{pmatrix} \tag{2}$$

$$J_z = \begin{pmatrix} \frac{5}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{3}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5}{2} \end{pmatrix} \tag{3}$$