$$\mathbf{Q_t} = \begin{array}{c} \\ \text{H} \\ \text{S1} \\ \text{S2} \\ \text{DOC} \\ \text{DS} \end{array} \overset{\displaystyle \begin{array}{ccccc} \text{H} & \text{S1} & \text{S2} & \text{DOC} & \text{DS} \end{array}}{\left(\begin{array}{ccccc} -(\mathbf{r\_HS1}_t + \mathbf{r\_HD}_t) & \mathbf{r\_HS1}_t & 0 & \mathbf{r\_HD}_t & 0 \\ \mathbf{r\_S1H}_t & -(\mathbf{r\_S1H}_t + \mathbf{r\_S1S2}_t + \mathbf{hr\_S1}_t \cdot \mathbf{r\_HD}_t) & \mathbf{r\_S1S2}_t & \mathbf{r\_HD}_t & \mathbf{hr\_S1}_t \cdot \mathbf{r\_HD}_t - \mathbf{r\_HD}_t \\ 0 & 0 & -(\mathbf{hr\_S2} \cdot \mathbf{r\_HD}_t) & \mathbf{r\_HD}_t & \mathbf{hr\_S2}_t \cdot \mathbf{r\_HD}_t - \mathbf{r\_HD}_t \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{array} \right)}$$

$$\mathbf{Q}_t = \begin{array}{c} \\ \text{H} \\ \text{S1} \\ \text{S2} \\ \text{D} \\ \text{trDS} \end{array} \overset{\displaystyle \begin{array}{ccccc} \text{H} & \text{S1} & \text{S2} & \text{D} & \text{trDS} \end{array}}{\left(\begin{array}{cccc:c} -(\mathbf{r\_HS1}_t + \mathbf{r\_HD}_t) & \mathbf{r\_HS1}_t & 0 & \mathbf{r\_HD}_t & 0 \\ \mathbf{r\_S1H}_t & -(\mathbf{r\_S1H}_t + \mathbf{r\_S1S2}_t + \mathbf{hr\_S1}_t \cdot \mathbf{r\_HD}_t) & \mathbf{r\_S1S2}_t & \mathbf{hr\_S1}_t \cdot \mathbf{r\_HD}_t & \mathbf{hr\_S1}_t \cdot \mathbf{r\_HD}_t - \mathbf{r\_HD}_t \\ 0 & 0 & -(\mathbf{hr\_S2}_t \cdot \mathbf{r\_HD}_t) & \mathbf{hr\_S2}_t \cdot \mathbf{r\_HD}_t & \mathbf{hr\_S2}_t \cdot \mathbf{r\_HD}_t - \mathbf{r\_HD}_t \\ 0 & 0 & 0 & 0 & 0 \\ \hdashline 0 & 0 & 0 & 0 & 0 \end{array} \right)}$$