$$\left(C_e \cdot \dot{e}\right)_e \cdot \dot{e}$$

$$C_1(e,t) = S(t) \cdot e(t) = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$C_2(e,t) = e_3 = 0$$
$$C_3(e,t) = e_4 = 0$$

$$\begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} S(t) \cdot e(t) \\ e_3 \\ e_4 \end{bmatrix}$$

$$S(t) = \begin{bmatrix} S_1 & 0 & S_2 & 0 & S_3 & 0 & S_4 & 0 \\ 0 & S_1 & 0 & S_2 & 0 & S_3 & 0 & S_4 \end{bmatrix}$$

$$e = \left[e_1, \dots, e_8\right]^T$$

$$S(t) \cdot e(t) = \begin{matrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \end{matrix}$$
$$\begin{bmatrix} S_1 & 0 & S_2 & 0 & S_3 & 0 & S_4 & 0 \\ 0 & S_1 & 0 & S_2 & 0 & S_3 & 0 & S_4 \end{bmatrix} \cdot \begin{bmatrix} e_1 \\ e_2 \\ \hline e_3 \\ e_4 \\ \hline e_5 \\ e_6 \\ \hline e_7 \\ e_8 \end{bmatrix} =$$

$$\frac{\partial}{\partial e_1}\left(S_1 \dot{e}_1\right) =$$

$$C(e,t)\begin{bmatrix} S(t)\cdot e(t) \\ e_3 \\ e_4 \end{bmatrix} = \begin{bmatrix} S_1\cdot e_1 + S_2\cdot e_3 + S_3\cdot e_5 + S_4\cdot e_7 \\ S_1\cdot e_2 + S_2\cdot e_4 + S_3\cdot e_6 + S_4\cdot e_8 \\ e_3 \\ e_4 \end{bmatrix}$$

$$C(e,t) = \begin{bmatrix} S_1\cdot e_1 + S_2\cdot e_3 + S_3\cdot e_5 + S_4\cdot e_7 \\ S_1\cdot e_2 + S_2\cdot e_4 + S_3\cdot e_6 + S_4\cdot e_8 \\ e_3 \\ e_4 \end{bmatrix} = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \\ C_4 \end{bmatrix}$$

$$\frac{dC(e,t)}{de} = \begin{bmatrix} \frac{\partial C_1}{\partial e_1} & \frac{\partial C_1}{\partial e_2} & \cdots & \frac{\partial C_1}{\partial e_8} \\ \frac{\partial C_2}{\partial e_1} & & & \\ \vdots & & & \\ \frac{\partial C_4}{\partial e_1} & & & \frac{\partial C_4}{\partial e_8} \end{bmatrix}$$

$$C_e(e,t) = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ S_1 & 0 & S_2 & 0 & S_3 & 0 & S_4 & 0 \\ 0 & S_1 & 0 & S_2 & 0 & S_4 & 0 & S_4 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} \ddot{e}_1 \\ \dot{e}_2 \\ \dot{e}_3 \\ \dot{e}_4 \\ \dot{e}_5 \\ \dot{e}_6 \\ \dot{e}_7 \\ \dot{e}_8 \end{bmatrix}$$

$$C_e(e,t)\cdot\dot{e} = \begin{bmatrix} S_1\dot{e}_1 + S_2\cdot\dot{e}_3 + S_3\cdot\dot{e}_5 + S_4\cdot\dot{e}_7 \\ S_1\cdot\dot{e}_2 + S_2\cdot\dot{e}_4 + S_3\cdot\dot{e}_6 + S_4\cdot\dot{e}_8 \\ \dot{e}_3 \\ \dot{e}_4 \end{bmatrix}$$

$$\frac{\partial}{\partial e}\left(C_e(e,t)\cdot\dot{e}\right) =$$