$$\frac{\delta}{\dot{\mathbf{x}}_{i} = \mathbf{A}_{ii}\mathbf{x}_{i} + \begin{bmatrix} \mathbf{B}_{i} & \mathbf{A}_{io} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{o} \end{pmatrix}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{i} \end{pmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{o} \end{bmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{o} \end{bmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{o} \end{bmatrix}}_{\dot{\mathbf{x}}_{o}} \underbrace{\mathbf{x}_{o}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{o} \end{bmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \delta \\ \mathbf{x}_{o} \end{bmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \begin{bmatrix} \mathbf{B}_{o} & \mathbf{A}_{oi} \end{bmatrix} \begin{pmatrix} \mathbf{A}_{o} & \mathbf{A}_{oi} \end{bmatrix}}_{\dot{\mathbf{x}}_{o}} = \mathbf{A}_{oo}\mathbf{x}_{o} + \mathbf$$