$$\begin{array}{c} a) \ \operatorname{rand}(\hat{\sigma}), \mathcal{T}_{\hat{\sigma}} \neq 0 \\ \mathcal{I}_{\ell} = \{(\hat{\sigma}_{1}, \dots, \hat{\sigma}_{\ell})\} \\ \mathcal{J}_{\ell} = \{(\hat{\sigma}_{\ell+1}, \dots, \hat{\sigma}_{\mathcal{L}})\} \end{array}$$

$$\begin{array}{c} T_{1} P_{1}^{-1} T_{2} \\ \vdots \\ \vdots \\ i_{0} \sigma_{1} j_{2} & i_{1} \sigma_{2} j_{3} \sigma_{3} & \dots & \sigma_{\mathcal{L}} \end{array}$$

$$\begin{array}{c} T_{1} P_{1}^{-1} T_{2} \\ \vdots \\ \vdots \\ T_{1} P_{1}^{-1} & \Pi_{2} \\ \vdots \\ \vdots \\ T_{1} P_{1}^{-1} & \dots & \underbrace{T_{\ell} P_{\ell}^{-1} T_{\ell+1}}_{j_{\ell} i_{\ell} i_{\ell} i_{\ell} i_{\ell-1} \sigma_{\ell}} \dots & \underbrace{P_{\mathcal{L}-1}^{-1} T_{\mathcal{L}}}_{j_{\mathcal{L}} i_{\ell-1} i_{\ell} i_{\ell} i_{\ell-1}} \dots & \underbrace{P_{\ell}^{-1} T_{\ell}}_{j_{\ell+1} i_{\ell} i_{\ell} i_{\ell-1} \sigma_{\ell}} \dots & \underbrace{P_{\ell}^{-1} T_{\ell}}_{j_{\ell} i_{\ell-1} i_{\ell} i_{\ell-1} i_{\ell} i_{\ell-1} i_{\ell}} \dots & \underbrace{P_{\ell}^{-1} T_{\ell}}_{j_{\ell} i_{\ell-1} i_{\ell} i_{\ell-1} i_{\ell} i_{\ell-1} i_{\ell} i_{\ell-1} i_{\ell-1}$$