$$f \[\underline{f} \] \xrightarrow{f \star \overrightarrow{g}} \tau_{\sigma_1}(g_1) \begin{bmatrix} g_1 \\ \dots \\ g_n \\ \hline \downarrow^{\sigma_1^{-1}} \\ \hline \downarrow^{\sigma_n^{-1}} \end{bmatrix} (\sigma_1, \dots, \sigma_n)^{-1}$$