$$\begin{CD}
X_1 \otimes X_2 @>f_1 \otimes f_2>> Y_1 \otimes Y_2 \\
@V\mathrm{br}_{X_1,X_2}VV @VV\mathrm{br}_{Y_1,Y_2}V \\
X_2 \otimes X_1 @>>f_2 \otimes f_1> Y_2 \otimes Y_1
\end{CD}$$