$$\begin{array}{ccc}
P \otimes_B M_B & \xrightarrow{\psi_M} & M_A \\
\downarrow{1 \otimes f_B} & & \downarrow{f_A} \\
P \otimes_B N_B & \xrightarrow{\psi_N} & N_A
\end{array}$$