Proposition 1. *Preservation of conditional dependence.* Let x_A, x_B, x_C be any latent or observed random variables in $p(\mathbf{x})$ with graph structure G, and let $\tilde{x}_A, \tilde{x}_B, \tilde{x}_C$ denote the corresponding random variables in the inverse model $\tilde{p}(\mathbf{x})$ with graph structure $\widetilde{G}$, constructed via the algorithm above. Then if $\tilde{x}_A$ and $\tilde{x}_B$ are conditionally independent given $\tilde{x}_C$ in the inverse model $\widetilde{G}$, they were also conditionally independent in the original model G; that is,

$$\tilde{x}_A \perp\!\!\!\perp \tilde{x}_B \middle| \tilde{x}_C \quad \Rightarrow \quad x_A \perp\!\!\!\perp x_B \middle| x_C.$$