$$\begin{aligned}
f(a^*, b) &= \top \wedge f(a^*, b) \\
&\preceq \mathrm{id}_A(a^*, a) \wedge f(a^*, b) \\
&\preceq \bigvee_{a' \in \mathbf{A}} \mathrm{id}_A(a^*, a') \wedge f(a'^*, b) \\
&= (\mathrm{id}_{\mathbf{A}} \mathbin{\mathring{,}} f)(a^*, b).
\end{aligned}$$