For which kinds of specifications $P$ and $Q$ is the following a theorem:

§ First, rewrite the two sides.
\[
\neg(P \land \neg Q) = \forall \sigma'' \cdot (\sigma' \rightarrow P) \sigma'' \Rightarrow (\sigma \rightarrow Q) \sigma'' \\
\neg(P \land \neg Q) = \exists \sigma'' \cdot (\sigma' \rightarrow P) \sigma'' \land (\sigma \rightarrow Q) \sigma''
\]

(a) $\neg(P \land \neg Q) \iff P \cdot Q$

§ If, for all prestates, $P$ is deterministic, then (a) is a theorem. (That's sufficient, but not necessary.)

(b) $P \cdot Q \iff \neg(P \land \neg Q)$

§ If, for all prestates, $P$ is satisfiable ($P$ is implementable), then (b) is a theorem.

(c) $P \cdot Q = \neg(P \land \neg Q)$

§ If, for all prestates, $P$ is satisfiable and deterministic, then (c) is a theorem.