It holds for all LTL formulas a and b.

$\neg(\neg b \mathbin{U} (\neg a \wedge \neg b)) \wedge F b$

$\equiv \neg(\neg b \mathbin{U} \neg(a \vee b)) \wedge F b$

$\equiv b \mathbin{R} (a \vee b) \wedge F b$ (R is Release operator)

$\equiv a \mathbin{W} b \wedge F b$ (W is Weak until operator)

$\equiv a \mathbin{U} b$