Inference at $*$ 1
of proof for Lemma equiv_rel_functionality_wrt_iff:

1. T : Type
2. T' : Type
3. E : $T \to T \to \mathbb{P}$
4. E' : $T' \to T' \to \mathbb{P}$
5. $T = T'$
6. $\forall x, y{:}T.\ E(x,y) \iff E'(x,y)$

$\vdash$ EquivRel(T;x,y.$E(x,y)$) $\iff$ EquivRel(T';x,y.$E'(x,y)$)
by (Repeat (Unfolds "equiv_rel refl sym trans" 0))

1:

$\vdash$ $(\forall a{:}T.\ E(a,a))$
& $(\forall a, b{:}T.\ E(a,b) \Rightarrow E(b,a))$
& $(\forall a, b, c{:}T.\ E(a,b) \Rightarrow E(b,c) \Rightarrow E(a,c)))$
$\iff$ $((\forall a{:}T'.\ E'(a,a))$
& $(\forall a, b{:}T'.\ E'(a,b) \Rightarrow E'(b,a))$
& $(\forall a, b, c{:}T'.\ E'(a,b) \Rightarrow E'(b,c) \Rightarrow E'(a,c)))$

.