```
inv_pair_iff_ooc  THM

⊢  ∀A,B:Type. (∃∈(A←→B)) ⟺ (A ∼ B)  by UnivCD
|
1. A : Type
2. B : Type
⊢  (∃∈(A←→B)) ⟺ (A ∼ B)  by Def of A←→B | A ∼ B
|
|\
| 3. ∃∈{fg:((A→B)×(B→A))| fg/f,g. InvFuns(A;B;f;g) }
| ⊢  ∃f:(A→B), g:(B→A). InvFuns(A;B;f;g)
| | by 2 Times Analyze3 THEN New:[f | g] Analyze-2 THEN Reduce Hyp:-1
| |
| 3. f : A→B
| 4. g : B→A
| 5. InvFuns(A;B;f;g)  [not for witness]
| ⊢  ∃f:(A→B), g:(B→A). InvFuns(A;B;f;g)
|   by Witness: f | g THEN Unhide
|
.\
. 3. ∃f:(A→B), g:(B→A). InvFuns(A;B;f;g)
. ⊢  ∃∈{fg:((A→B)×(B→A))| fg/f,g. InvFuns(A;B;f;g) }
. | by ExistHD Hyp:-1
. |
. 3. f : A→B
. 4. g : B→A
. 5. InvFuns(A;B;f;g)
. ⊢  ∃∈{fg:((A→B)×(B→A))| fg/f,g. InvFuns(A;B;f;g) }
. | by Witness: <f,g>
. |
. ⊢  <f,g> ∈ {fg:((A→B)×(B→A))| fg/f,g. InvFuns(A;B;f;g) }
.   by Analyze THEN Reduce Concl
END
```