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list_all_is_member_nil_lemma  THM

⊢  ∀eq:(T→T→𝔹), L:T List. ∀x∈L.x(∈eq) nil ⟺ nil = L
| by UnivCD THEN Analyze 0
|
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| 1. T : Type
| 2. eq : T→T→𝔹
| 3. L : T List
| ⊢  ∀x∈L.x(∈eq) nil ⇒ nil = L
| | by Analyze 3 THEN Rewrite (HigherC list_all_unrollC) 0
| |    THENL
| |    [Auto;Analyze 0]
| |
| 4. u : T
| 5. v : T List
| 6. u(∈eq) nil & ∀x∈v.x(∈eq) nil
| ⊢  nil = u.v  by Reduce -1
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. 1. T : Type
. 2. eq : T→T→𝔹
. 3. L : T List
. ⊢  ∀x∈L.x(∈eq) nil ⇐ (nil = L)  by Analyze 0
. |
. 4. nil = L
. ⊢  ∀x∈L.x(∈eq) nil  by RevHypSubst 4 0
. |
. ⊢  ∀x∈nil.x(∈eq) nil
.   by Rewrite (HigherC list_all_unrollC) 0 THEN Trivial
END
```