```
assert_l_ball  THM

⊢  ∀T:Type, L:T List, P:(T→𝔹). (∀x∈L.P(x)) ⟺ (∀i:ℕ||L||. P(L[i]))
| by InductionOnList THEN (Reduce 0)
|    THEN
|    (Try (RW assert_pushdownC 0))
|
|\
| 1. T : Type
| 2. T List
| 3. u : T
| 4. v : T List
| 5. ∀P:(T→𝔹). (∀x∈v.P(x)) ⟺ (∀i:ℕ||v||. P(v[i]))
| 6. P : T→𝔹
| 7. P(u)
| 8. (∀x∈v.P(x))
| 9. i : ℕ(||v||+1)
| ⊢  P([u / v][i])
| | by (InstHyp [P] 5) THEN ThinTrivial THEN (CaseNat 0 ‘i’)
| |    THEN
| |    (Reduce 0)
| |
| 1. T : Type
| 2. T List
| 3. u : T
| 4. v : T List
| 5. ∀P:(T→𝔹). (∀x∈v.P(x)) ⟺ (∀i:ℕ||v||. P(v[i]))
| 6. P : T→𝔹
| 7. P(u)
| 8. (∀x∈v.P(x))
| 9. i : ℕ(||v||+1)
| 10. (∀x∈v.P(x)) ⇐ (∀i:ℕ||v||. P(v[i]))
| 11. ∀i:ℕ||v||. P(v[i])
| 12. ¬i = 0
| ⊢  P([u / v][i])
|   by (RWO
|       Thm* ∀a:T, as:T List, i:ℤ.
|            0<i ⇒ i≤||as|| ⇒ [a / as][i] = as[(i-1)]
|       {select_cons_tl}
|       0)
|      THEN
|      EasyHyp
|
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| 1. T : Type
| 2. T List
| 3. u : T
| 4. v : T List
| 5. ∀P:(T→𝔹). (∀x∈v.P(x)) ⟺ (∀i:ℕ||v||. P(v[i]))
| 6. P : T→𝔹
| 7. ∀i:ℕ(||v||+1). P([u / v][i])
| ⊢  P(u)  by (InstHyp [0] -1) THEN (Reduce -1)
|
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. 1. T : Type
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. 2. T List
. 3. u : T
. 4. v : T List
. 5. ∀P:(T→𝔹). (∀x∈v.P(x)) ⟺ (∀i:ℕ||v||. P(v[i]))
. 6. P : T→𝔹
. 7. ∀i:ℕ(||v||+1). P([u / v][i])
. ⊢  (∀x∈v.P(x))  by BackThruSomeHyp
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. 1. T : Type
. 2. T List
. 3. u : T
. 4. v : T List
. 5. ∀P:(T→𝔹). (∀x∈v.P(x)) ⟺ (∀i:ℕ||v||. P(v[i]))
. 6. P : T→𝔹
. 7. ∀i:ℕ(||v||+1). P([u / v][i])
. 8. i : ℕ||v||
. ⊢  P(v[i])  by InstHyp [i+1] -2
. |
. 1. T : Type
. 2. T List
. 3. u : T
. 4. v : T List
. 5. ∀P:(T→𝔹). (∀x∈v.P(x)) ⟺ (∀i:ℕ||v||. P(v[i]))
. 6. P : T→𝔹
. 7. ∀i:ℕ(||v||+1). P([u / v][i])
. 8. i : ℕ||v||
. 9. P([u / v][(i+1)])
. ⊢  P(v[i])
.   by (RWO
.       Thm* ∀a:T, as:T List, i:ℤ.
.            0<i ⇒ i≤||as|| ⇒ [a / as][i] = as[(i-1)]
.       {select_cons_tl}
.       -1)
.      THEN
.      (NthHypSq -1)
.      THEN
.      Analyze
END
```