```
proper_sublist_length  THM

⊢  ∀T:Type, L1,L2:T List. L1 ⊆ L2 ⇒ ||L1|| = ||L2|| ⇒ L1 = L2
| by Auto THEN BackThruLemma ‘list_extensionality‘ THEN Auto’
|
1. T : Type
2. L1 : T List
3. L2 : T List
4. L1 ⊆ L2
5. ||L1|| = ||L2||
6. i : ℕ
7. i<||L1||
⊢  L1[i] = L2[i]
| by AllHyps (Unfold ‘sublist‘) THEN ExRepD
THEN AllHyps (InstHyp [i
|    ]) THENA Auto
|
|
1. T : Type
2. L1 : T List
3. L2 : T List
4. f : ℕ||L1||→ℕ||L2||
5. increasing(f;||L1||)
6. ∀j:ℕ||L1||. L1[j] = L2[(f(j))]
7. ||L1|| = ||L2||
8. i : ℕ
9. i<||L1||
10. L1[i] = L2[(f(i))]
⊢  L1[i] = L2[i]
| by InstLemma ‘increasing_is_id‘ [||L1||;f;i] THEN Auto
|
1. T : Type
2. L1 : T List
3. L2 : T List
4. f : ℕ||L1||→ℕ||L2||
5. increasing(f;||L1||)
6. ∀j:ℕ||L1||. L1[j] = L2[(f(j))]
7. ||L1|| = ||L2||
8. i : ℕ
9. i<||L1||
10. L1[i] = L2[(f(i))]
11. f(i) = i
⊢  L1[i] = L2[i]  by HypSubstSq (-1) (-2) THEN Auto
END
```