```
listify_select_id  THM

⊢  ∀as:T List. (λi:ℕ||as||. as[i]){ℕ||as||} = as  by UnivCD
|
1. T : Type
2. as : T List
⊢  (λi:ℕ||as||. as[i]){ℕ||as||} = as
| by Assert (∀n,j:ℕ. j+||as|| = n ⇒ (λi.as[(i-j)]){j..n⁻} = as)
|    THENA
|    UnivCD
|
|\
| 3. n : ℕ
| 4. j : ℕ
| 5. j+||as|| = n
| ⊢  (λi.as[(i-j)]){j..n⁻} = as
| | by MoveToConcl 4 THEN ListInd 2 THEN AbReduce 0 THEN UnivCD
| |
| |\
| | 5. j+0 = n
| | ⊢  (λi.nil[(i-j)]){j..n⁻} = nil
| |   by RecUnfold ‘listify‘ 0 THEN SplitOnConclITE
| |
| .\
| . 4. u : T
| . 5. v : T List
| . 6. ∀j:ℕ. j+||v|| = n ⇒ (λi.v[(i-j)]){j..n⁻} = v
| . 7. j : ℕ
| . 8. j+||v||+1 = n
| . ⊢  (λi.(u.v)[(i-j)]){j..n⁻} = u.v  by RecCaseSplit ‘listify‘
| . |
| . |\
| . | .....truecase .....
| . | 9. n≤j
| . | ⊢  nil = u.v  by Auto
| . |
| . .\
| . . 9. j<n
| . . ⊢  (u.v)[(j-j)].(λi.(u.v)[(i-j)]){(j+1)..n⁻} = u.v  by Analyze
| . . |
| . . |\
| . . | ⊢  (u.v)[(j-j)] = u
| . . |   by RWH
| . . |      (LemmaC
| . . |       Thm* ∀a:T, as:T List, i:ℤ. i≤0 ⇒ (a.as)[i] = a
| . . |       {select_cons_hd})
| . . |      0
| . . |
| . . .\
| . . . ⊢  (λi.(u.v)[(i-j)]){(j+1)..n⁻} = v
| . . . | by RWH
| . . . |    (LemmaC
| . . . |     Thm* ∀a:T, as:T List, i:ℤ.
| . . . |          0<i ⇒ i≤||as|| ⇒ (a.as)[i] = as[(i-1)]
| . . . |     {select_cons_tl})
```

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| . . . |    0
| . . . |
| . . . ⊢  (λi.v[(i-j-1)]){(j+1)..n⁻} = v  by InstHyp [j+1] 6
| . . . |
| . . . 10. (λi.v[(i-(j+1))]){(j+1)..n⁻} = v
| . . . ⊢  (λi.v[(i-j-1)]){(j+1)..n⁻} = v  by OnMCls [0;10] ArithSimp
|
.\
. 3. ∀n,j:ℕ. j+||as|| = n ⇒ (λi.as[(i-j)]){j..n⁻} = as
. ⊢  (λi:ℕ||as||. as[i]){ℕ||as||} = as
.   by (InstHyp [||as||;0] 3) THEN (ArithSimp -1)
END
```