```
adjl-vertex-accum-properties  THM

⊢  ∀A:AdjList, T:Type, s:T, f:(T→Vertices(adjl-graph(A))→T).
|  ∃L:Vertices(adjl-graph(A)) List.
|  no_repeats(Vertices(adjl-graph(A));L)
|  & (∀y:Vertices(adjl-graph(A)). (y ∈ L))
|  & adjl-vertex-accum(A;s',x'.f(s',x');s)
|    =
|    list_accum(s',x'.f(s',x');s;L)
| by (Unfolds [‘adjl-graph‘;‘adjl-vertex-accum‘] 0) THEN (Reduce 0)
|    THEN
|    (InstConcl [upto(0;A.size)])
|
|\
| 1. A : AdjList
| 2. T : Type
| 3. T
| 4. T→ℕA.size→T
| ⊢  no_repeats(ℕA.size;upto(0;A.size))
|   by (Inst Thm* ∀i,j:ℕ. no_repeats(ℕ;upto(i;j))    {no_repeats_upto}
|       [0;A.size])
|      THEN
|      (Repeat (ParallelOp -1))
|
|\
| 1. A : AdjList
| 2. T : Type
| 3. T
| 4. T→ℕA.size→T
| 5. y : ℕA.size
| ⊢  (y ∈ upto(0;A.size))
|   by (AssertBY (y ∈ upto(0;A.size))
|       (RWO
|        Thm* ∀i,j,k:ℕ. (k ∈ upto(i;j)) ⟺ i≤k & k<j    {member_upto}
|        0))
|      THEN
|      (RepeatFor 2 (ParallelOp -1))
|      THEN
|      ExRepD
|
.\
. 1. A : AdjList
. 2. T : Type
. 3. s : T
. 4. f : T→ℕA.size→T
. ⊢  primrec(A.size;s;λx',s'. f(s',x'))
.    =
.    list_accum(s',x'.f(s',x');s;upto(0;A.size))
.   by (RWO
.       Thm* ∀n:ℕ, f,x:Top.
.            primrec(n;x;f) ~ list_accum(i,y.f(y,i);x;upto(0;n))
.       {primrec_list_accum}
.       0)
.      THEN
.      (Reduce 0)
```

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END
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