```
symmetric_swap_adjacent  THM

⊢  ∀A:Type, P:(A→A→Prop).
|  (Sym x,y:A. P(x,y))
|  ⇒
|  (Sym L1,L2:A List. L1 swap adjacent[P(x,y)] L2)
| by Unfolds ``sym swap_adjacent`` 0 THEN Reduce 0 THEN Auto

|    THEN ParallelOp (-1) THEN ExRepD

|    THEN FwdThruLemma `swapped_select` [(-1)] THEN Auto'
|
|
|
1. A : Type
2. P : A→A→Prop
3. ∀a,b:A. P(a,b) ⇒ P(b,a)
4. a : A List
5. b : A List
6. i : ℕ(||a||-1)
7. P(a[i],a[(i+1)])
8. b = swap(a;i;i+1)
9. b[i] = a[(i+1)]
10. b[(i+1)] = a[i]
11. ||b|| = ||a||
12. a = swap(b;i;i+1)
13. ∀x:ℕ||b||. ¬x = i ⇒ ¬x = i+1 ⇒ b[x] = a[x]
⊢  P(b[i],b[(i+1)])
  by WeakSubstFor b[i] 0 THENM WeakSubstFor b[(i+1)] 0 THENA Auto

     THEN EasyHyp
END
```