```
delivered_before_somewhere_lemma  THM

⊢  ∀E:EventStruct, a,b,c:|E|, tr:|E| List.
|  a somewhere delivered before b ⇒
|  a somewhere delivered before c ∨ c somewhere delivered before b
| by  Auto
THEN Decide a somewhere delivered before c THEN Auto

|    THEN Decide c somewhere delivered before b THEN Auto

|    THEN SimpConcl
|
1. E : EventStruct
2. a : |E|
3. b : |E|
4. c : |E|
5. tr : |E| List
6. a somewhere delivered before b
7. ¬a somewhere delivered before c
8. ¬c somewhere delivered before b
⊢  False
| by AllHyps (RWO "not_delivered_before_somewhere") THENA Auto

|    THEN AllHyps (Unfold ‘delivered_before_somewhere‘) THEN ExRepD
|
1. E : EventStruct
2. a : |E|
3. b : |E|
4. c : |E|
5. tr : |E| List
6. k : ℕ||tr||
7. a delivered at time k
8. ∀k':ℕ||tr||.
   b delivered at time k' ⇒ loc(E)(tr[k']) = loc(E)(tr[k]) ⇒ k≤k'
9. ∀k:ℕ||tr||.
   a delivered at time k ⇒
   (∃k':ℕ||tr||.
    k'<k & c delivered at time k' & loc(E)(tr[k']) = loc(E)(tr[k]))
10. ∀k:ℕ||tr||.
    c delivered at time k ⇒
    (∃k':ℕ||tr||.
     k'<k & b delivered at time k' & loc(E)(tr[k']) = loc(E)(tr[k]))
⊢  False
  by InstHyp [k] (-2) THENA Auto THEN ExRepD
THEN InstHyp [k'
     ] (-5) THENA Auto THEN ExRepD
THEN InstHyp [k'@0
     ] (-11) THEN Auto
END
```