```
unzip_zip  THM

⊢  ∀T1,T2:Type, as:T1 List, bs:T2 List.
|  ||as|| = ||bs|| ⇒ unzip(zip(as;bs)) = <as,bs>
| by D 0 THENM D 0 THENM D 0 THENA Auto

|    THEN ListInd (-1) THEN D 0 THENA Auto

|    THEN ListInd (-1) THEN Unfold ‘unzip‘ 0

|    THEN RecUnfold ‘zip‘ 0 THEN Reduce 0
THEN Try (Complete Auto’)
|
1. T1 : Type
2. T2 : Type
3. T1 List
4. u : T1
5. v : T1 List
6. ∀bs:T2 List. ||v|| = ||bs|| ⇒ unzip(zip(v;bs)) = <v,bs>
7. T2 List
8. u1 : T2
9. v1 : T2 List
10. ||[u / v]|| = ||v1|| ⇒ unzip(zip([u / v];v1)) = <[u / v],v1>
⊢  ||v||+1 = ||v1||+1
   ⇒
   <[u / map(λp.1of(p);zip(v;v1))],[u1 / map(λp.2of(p);zip(v;v1))]>
   =
   <[u / v],[u1 / v1]>
  by D 0 THENM InstHyp [v1] 6
THENM Unfold ‘unzip‘ (-1)

     THENM ApFunToHypEquands ‘z’ z.1 T1 List (-1)
THENM Reduce (-1)

     THENM ApFunToHypEquands ‘z’ z.2 T2 List (-2)
THENM Reduce (-1)

     THENA Auto’
THEN EqCD THEN EqCD THEN Try (Complete Auto)
END
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