```
map2_wf  THM

⊢  ∀'a,'b,'c:Type, f:('a→'b→'c), l1:'a List, l2:'b List.
|  map2(f;l1;l2) ∈ 'c List  by RepD
|
1. 'a : Type
2. 'b : Type
3. 'c : Type
4. f : 'a→'b→'c
5. l1 : 'a List
6. l2 : 'b List
⊢  map2(f;l1;l2) ∈ 'c List
| by MoveToConcl 6 THEN Last ListInd THEN Simp THEN StrongAuto
|
|\
| 1. 'a : Type
| 2. 'b : Type
| 3. 'c : Type
| 4. f : 'a→'b→'c
| 5. 'a List
| 6. l2 : 'b List
| ⊢  map2(f;nil;l2) ∈ 'c List
|   by RecUnfold `map2` 0 THEN Simp THEN StrongAuto
|
.\
. 1. 'a : Type
. 2. 'b : Type
. 3. 'c : Type
. 4. f : 'a→'b→'c
. 5. 'a List
. 6. u : 'a
. 7. v : 'a List
. 8. ∀l2:'b List. map2(f;v;l2) ∈ 'c List
. 9. l2 : 'b List
. ⊢  map2(f;cons(u; v);l2) ∈ 'c List
. | by Last ListInd THEN Simp THEN StrongAuto THEN HypBackchain
. |    THEN
. |    StrongAuto
. |    THEN
. |    Try (Complete (Unfold `label` 0))
. |
. |\
. | 1. 'a : Type
. | 2. 'b : Type
. | 3. 'c : Type
. | 4. f : 'a→'b→'c
. | 5. 'a List
. | 6. u : 'a
. | 7. v : 'a List
. | 8. ∀l2:'b List. map2(f;v;l2) ∈ 'c List
. | 9. 'b List
. | ⊢  map2(f;cons(u; v);nil) ∈ 'c List
. |   by RecUnfold `map2` 0 THEN Simp THEN StrongAuto
. |
. .\
```

```
. . 1. 'a : Type
. . 2. 'b : Type
. . 3. 'c : Type
. . 4. f : 'a→'b→'c
. . 5. 'a List
. . 6. u : 'a
. . 7. v : 'a List
. . 8. ∀l2:'b List. map2(f;v;l2) ∈ 'c List
. . 9. 'b List
. . 10. u1 : 'b
. . 11. v1 : 'b List
. . 12. map2(f;cons(u; v);v1) ∈ 'c List
. . ⊢  map2(f;cons(u; v);cons(u1; v1)) ∈ 'c List
. . | by RecUnfold `map2` 0 THEN Simp THEN StrongAuto
. . |
. . .....subterm .....
. . 1. 'a : Type
. . 2. 'b : Type
. . 3. 'c : Type
. . 4. f : 'a→'b→'c
. . 5. 'a List
. . 6. u : 'a
. . 7. v : 'a List
. . 8. ∀l2:'b List. map2(f;v;l2) ∈ 'c List
. . 9. 'b List
. . 10. 'b
. . 11. v1 : 'b List
. . 12. map2(f;cons(u; v);v1) ∈ 'c List
. . ⊢  map2(f;v;v1) ∈ 'c List
. .   by HypBackchain THEN StrongAuto
. .      THEN
. .      Try (Complete (Unfold `label` 0))
END
```