```
rel_subst2_addprime  THM

⊢  ∀r:rel(), as:(Label×Term) List.
|  1of(unzip(as)) = rel_vars(r)
|  ⇒
|  rel_subst2(as;(r)') = rel_subst(as;r)
| by Auto THEN Unfolds ``rel_subst rel_subst2 rel_addprime`` 0

|    THEN Reduce 0
THEN EqCD
THEN Auto
|
.....subterm .....
1. r : rel()
2. as : (Label×Term) List
3. 1of(unzip(as)) = rel_vars(r)
⊢  map(λt.term_subst2(as;t);map(λt.(t)';r.args))
|  =
|  map(λt.term_subst(as;t);r.args)
| by InstLemma `map_map_sq` [Term;r.args;λt.(t)';λt.term_subst2(as;t)
|    ] THENA Auto
THEN HypSubst (-1) 0
THEN Thin (-1)
|
|
1. r : rel()
2. as : (Label×Term) List
3. 1of(unzip(as)) = rel_vars(r)
⊢  map((λt.term_subst2(as;t)) o (λt.(t)');r.args)
|  =
|  map(λt.term_subst(as;t);r.args)
| by Subst (λt.term_subst2(as;t)) o (λt.(t)')
|          =
|          (λt.term_subst2(as;(t)')) 0 THENA Auto
|
|
|\
| .....equality .....
| 1. r : rel()
| 2. as : (Label×Term) List
| 3. 1of(unzip(as)) = rel_vars(r)
| ⊢  (λt.term_subst2(as;t)) o (λt.(t)') = (λt.term_subst2(as;(t)'))
|   by Ext THEN Reduce 0 THEN Auto
|
.\
. 1. r : rel()
. 2. as : (Label×Term) List
. 3. 1of(unzip(as)) = rel_vars(r)
. ⊢  map(λt.term_subst2(as;(t)');r.args)
. |  =
. |  map(λt.term_subst(as;t);r.args)
. | by BackThruLemma `list_extensionality` THENA Auto
. |
. |
. |\
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. | 1. r : rel()
. | 2. as : (Label×Term) List
. | 3. 1of(unzip(as)) = rel_vars(r)
. | ⊢  ||map(λt.term_subst2(as;(t)');r.args)||
. |     =
. |     ||map(λt.term_subst(as;t);r.args)||
. |    by RWW "map_length_nat" 0 THEN Auto'
. |
. .\
. . 1. r : rel()
. . 2. as : (Label×Term) List
. . 3. 1of(unzip(as)) = rel_vars(r)
. . ⊢  ∀i:ℕ.
. . |  i<||map(λt.term_subst2(as;(t)');r.args)||
. . |  ⇒
. . |  map(λt.term_subst2(as;(t)');r.args)[i]
. . |  =
. . |  map(λt.term_subst(as;t);r.args)[i]
. . | by RWW "map_select" 0 THEN Auto
. .
. . |    THEN RWW "map_length_nat" (-1) THEN Auto
. . THEN Reduce 0
. . |
. . 1. r : rel()
. . 2. as : (Label×Term) List
. . 3. 1of(unzip(as)) = rel_vars(r)
. . 4. i : ℕ
. . 5. i<||r.args||
. . ⊢  term_subst2(as;(r.args[i])') = term_subst(as;r.args[i])
. . | by BackThruLemma `term_subst2_addprime` THEN Auto
. . |
. . 1. r : rel()
. . 2. as : (Label×Term) List
. . 3. 1of(unzip(as)) = rel_vars(r)
. . 4. i : ℕ
. . 5. i<||r.args||
. . 6. v : Label
. . 7. (v ∈ term_vars(r.args[i]))
. . ⊢  (v ∈ 1of(unzip(as)))
. .   by SubstFor 1of(unzip(as)) 0
. . THENM RWW "member_rel_vars" 0
. .
. .      THENM AutoInstConcl []
. . THEN Auto
END
```