```
trace_consistent_wp2_rel  THM

⊢  ∀A:ioa{i:l}(), rho:Decl, r:rel(), R:(Label→Label→𝔹), k:Label.
|  ¬ioa_mentions_trace(A)
|  ⇒
|  trace_consistent_rel(rho;A.da;R;r)
|  ⇒
|  trace_consistent_pred(rho;A.da;R;wp2_rel(A;k;r))  by Auto
|
1. A : ioa{i:l}()
2. rho : Decl
3. r : rel()
4. R : Label→Label→𝔹
5. k : Label
6. ¬ioa_mentions_trace(A)
7. trace_consistent_rel(rho;A.da;R;r)
⊢  trace_consistent_pred(rho;A.da;R;wp2_rel(A;k;r))
| by Unfold `trace_consistent_pred` 0 THEN

|    Unfolds ``col_all wp2_rel`` 0 THEN Auto

|    THEN  Try (Fold `pred` 0 THEN Auto)
|
1. A : ioa{i:l}()
2. rho : Decl
3. r : rel()
4. R : Label→Label→𝔹
5. k : Label
6. ¬ioa_mentions_trace(A)
7. trace_consistent_rel(rho;A.da;R;r)
8. r@0 : rel()
9. r@0 ∈ col_subst2(λx.smts_eff(action_effect(k;A.eff;A.frame);x);r)
⊢  trace_consistent_rel(rho;A.da;R;r@0)
| by RWO "member_col_subst2" (-1)
THENA Auto

|    THEN ExRepD THEN HypSubstSq (-1) 0

|    THEN BackThruLemma `trace_consistent_rel_subst2` THEN Auto
|
1. A : ioa{i:l}()
2. rho : Decl
3. r : rel()
4. R : Label→Label→𝔹
5. k : Label
6. ¬ioa_mentions_trace(A)
7. trace_consistent_rel(rho;A.da;R;r)
8. r@0 : rel()
9. as : (Label×Term) List
10. 1of(unzip(as)) = rel_primed_vars(r)
11. ∀i:ℕ.
    i<||as||
    ⇒
    2of(as[i]) ∈ (λx.smts_eff(action_effect(k;A.eff;A.frame);x))
                 (1of(as[i]))
```

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12. r@0 = rel_subst2(as;r)
⊢  ¬subst_mentions_trace(as)
  by Reduce (-2)

     THEN BackThruLemma' `effect_subst_mentions_trace` THEN Auto
END
```