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memoryless_remove_msgs  THM

⊢  ∀E:EventStruct, P:TraceProperty(E), L,L1:|E| List.
|  memorylessR(E) preserves P ⇒ P(L) ⇒ P((L -x =msg=(E) y L1))
| by Unfold ‘trace_property‘ 0 THEN Auto

|    THEN ListInd (-3) THEN Unfold ‘remove_msgs‘ 0 THEN Reduce 0
|
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| 1. E : EventStruct
| 2. P : (|E| List)→Prop
| 3. L : |E| List
| 4. |E| List
| 5. memorylessR(E) preserves P
| 6. P(L)
| ⊢  P(filter(λx.true₂;L))
|   by Subst filter(λa.true₂;L) ∼ L 0 THEN Try Trivial
|
|      THEN Try (BackThruLemma ‘filter_trivial‘ THEN Auto)
|
|      THEN Try (Unfolds ‘‘l_all so_apply‘‘ 0 THEN Reduce 0
|
|                        THEN RW assert_pushdownC 0 THEN Auto)
|
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. 1. E : EventStruct
. 2. P : (|E| List)→Prop
. 3. L : |E| List
. 4. |E| List
. 5. memorylessR(E) preserves P
. 6. P(L)
. 7. u : |E|
. 8. v : |E| List
. 9. P((L -x =msg=(E) y v))
. ⊢  P
. |  (filter(λx.¬₂(x =msg=(E) u)∧₂reduce(λy,y@0. ¬₂(x =msg=(E) y)∧₂
. |   y@0;true₂;v);L))
. | by Subst filter(λa.¬₂(a =msg=(E) u)∧₂reduce(λb,y. ¬₂(a =msg=(E) b)
. |                                                  ∧₂
. |
. |    y;true₂;v);L) ∼ filter(λa.¬₂(a =msg=(E) u);filter(λa.
. |    reduce(λb,y. ¬₂(a =msg=(E) b)∧₂y;true₂;v);L)) 0
. |
. |\
. | .....equality .....
. | 1. E : EventStruct
. | 2. P : (|E| List)→Prop
. | 3. L : |E| List
. | 4. |E| List
. | 5. memorylessR(E) preserves P
. | 6. P(L)
. | 7. u : |E|
. | 8. v : |E| List
. | 9. P((L -x =msg=(E) y v))
. | ⊢  filter(λa.¬₂(a =msg=(E) u)∧₂reduce(λb,y. ¬₂(a =msg=(E) b)∧₂
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. |    y;true₂;v);L) ∼ filter(λa.¬₂(a =msg=(E) u);filter(λa.
. |    reduce(λb,y. ¬₂(a =msg=(E) b)∧₂y;true₂;v);L))
. |   by RW FilterFilterC 0 THEN Reduce 0 THEN Trivial
. |
. .\
. . 1. E : EventStruct
. . 2. P : (|E| List)→Prop
. . 3. L : |E| List
. . 4. |E| List
. . 5. memorylessR(E) preserves P
. . 6. P(L)
. . 7. u : |E|
. . 8. v : |E| List
. . 9. P((L -x =msg=(E) y v))
. . ⊢  P
. .    (filter(λa.¬₂(a =msg=(E) u);filter(λa.reduce(λb,y.
. .     ¬₂(a =msg=(E) b)∧₂y;true₂;v);L)))
. .   by Fold ‘remove_msgs‘ 0
. .
. .      THEN AllHyps (\h. Unfolds ‘‘preserved_by R_memoryless‘‘ h
. .
. .             THEN Using [‘x’,(L -x =msg=(E) y v)] (BackThruHyp h))
. .
. . THEN Reduce 0 THEN Auto
. . THEN InstConcl [u] THEN Auto
END
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