```
ma-single-sends1_wf  THM

⊢  ∀A,B,T:Type, x:Id, a:Knd, tg:Id, l:IdLnk, f:(A→B→(T List)).
|  (a = rcv(l; tg) ⇒ T = B)
|  ⇒
|  ma-single-sends1(A; B; T; x; a; l; tg; f) ∈ MsgA
| by Auto THEN AssertBY (x : A ∈ x:Id fp-> Type) Auto
|    THEN
|    AssertBY (a : B ∈ x:Knd fp-> Type) Auto
|    THEN
|    Unfold `ma-single-sends1` 0
|    THEN
|    Try (Fold `ma-state` 0)
|    THEN
|    All (Unfold `ma-valtype`)
|    THEN
|    All
|    (RWO
|     Thm* ∀eq:EqDecider(A), f,g:a:A fp-> Top, x:A, z:Top.
|          f ⊕ g(x)?z ∼ if x ∈ dom(f)→ f(x)?z else g(x)?z fi
|     {fpf_DASH_join_DASH_cap_DASH_sq})
|    THEN
|    All Reduce
|
|\
| 1. A : Type
| 2. B : Type
| 3. T : Type
| 4. x : Id
| 5. a : Knd
| 6. tg : Id
| 7. l : IdLnk
| 8. A→B→(T List)
| 9. a = rcv(l; tg) ⇒ T = B
| 10. x : A ∈ x:Id fp-> Type
| 11. a : B ∈ x:Knd fp-> Type
| 12. State(x : A)
| 13. v : if a ∈ dom(a : B)→ B else rcv(l; tg) : T(a)?Top fi
| ⊢  v ∈ B  by SplitOnHypITE -1 THEN Analyze -1
| |
| 1. A : Type
| 2. B : Type
| 3. T : Type
| 4. x : Id
| 5. a : Knd
| 6. tg : Id
| 7. l : IdLnk
| 8. A→B→(T List)
| 9. a = rcv(l; tg) ⇒ T = B
| 10. x : A ∈ x:Id fp-> Type
| 11. a : B ∈ x:Knd fp-> Type
| 12. State(x : A)
| 13. rcv(l; tg) : T(a)?Top
| ⊢  a ∈ dom(a : B)
|   by Unfolds [`fpf-dom`;`fpf-single`] 0 THEN Reduce 0
```

```
|      THEN
|      RWO
|      Thm* ∀d:EqDecider(A), i:A. (eqof(d)(i,i)) ~ true₂
|      {eqof_eq_btrue}
|      0
|      THEN
|      Reduce 0
|
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. 1. A : Type
. 2. B : Type
. 3. T : Type
. 4. x : Id
. 5. a : Knd
. 6. tg : Id
. 7. l : IdLnk
. 8. f : A→B→(T List)
. 9. a = rcv(l; tg) ⇒ T = B
. 10. x : A ∈ x:Id fp-> Type
. 11. a : B ∈ x:Knd fp-> Type
. 12. s : State(x : A)
. 13. v : if a ∈ dom(a : B)→ B else rcv(l; tg) : T(a)?Top fi
. 14. f(s(x),v) = f(s(x),v)
. 15. T List
. 16. T List
. 17. u : T
. ⊢  u ∈ if rcv(l; tg) ∈ dom(a : B)→ a : B(rcv(l; tg))?Void else T fi
. | by SplitOnConclITE
. |
. .....truecase .....
. 1. A : Type
. 2. B : Type
. 3. T : Type
. 4. x : Id
. 5. a : Knd
. 6. tg : Id
. 7. l : IdLnk
. 8. f : A→B→(T List)
. 9. a = rcv(l; tg) ⇒ T = B
. 10. x : A ∈ x:Id fp-> Type
. 11. a : B ∈ x:Knd fp-> Type
. 12. s : State(x : A)
. 13. v : if a ∈ dom(a : B)→ B else rcv(l; tg) : T(a)?Top fi
. 14. f(s(x),v) = f(s(x),v)
. 15. T List
. 16. T List
. 17. u : T
. 18. rcv(l; tg) ∈ dom(a : B)
. ⊢  u ∈ a : B(rcv(l; tg))?Void
.   by RWO
.      Thm* ∀eq:EqDecider(A), x,y:A, v:Top. x ∈ dom(y : v) ⟺ x = y
.      {fpf_DASH_single_DASH_dom}
.      -1
.      THEN
.      DoSubsume
```

```
.       THEN
.       SubtypeRelEq
.       THEN
.       HypSubst -1 0
.       THEN
.       Reduce 0
.       THEN
.       BackThruSomeHyp
END
```