```
w-index_wf  THM

⊢  ∀the_w:World, e:E.
|  FairFifo
|  ⇒
|  isrcv(kind(e)) ⇒ index(e) ∈ ℕ||sends(lnk(kind(e));sender(e))||
| by RepeatFor 4 (Analyze 0)
|
1. the_w : World
2. e : E
3. FairFifo
4. isrcv(kind(e))
⊢  index(e) ∈ ℕ||sends(lnk(kind(e));sender(e))||
| by AssertBY (∃n:ℕtime(e). match(lnk(kind(e));n;time(e)))
|    (BackThru
|     Thm* ∀the_w:World, e:E.
|          FairFifo
|          ⇒
|          isrcv(kind(e))
|          ⇒
|          (∃t:ℕtime(e). match(lnk(kind(e));t;time(e)))
|     {w_DASH_match_DASH_exists})
|    THEN
|    Inst
|    Thm* ∀f:(ℕ→𝔹).
|         (∃n:ℕ. f(n)) ⇒ f(mu(f)) & (∀i:ℕ. i<mu(f) ⇒ ¬f(i))
|    {mu_DASH_property}
|    [λt.match(lnk(kind(e));t;time(e))]
|    THENA
|    (Reduce 0 THEN ParallelOp -1)
|    THEN
|    Reduce -1
|    THEN
|    ExRepD
|
1. the_w : World
2. e : E
3. FairFifo
4. isrcv(kind(e))
5. n : ℕtime(e)
6. match(lnk(kind(e));n;time(e))
7. match(lnk(kind(e));mu(λt.match(lnk(kind(e));t;time(e)));time(e))
8. ∀i:ℕ.
|  i<mu(λt.match(lnk(kind(e));t;time(e)))
|  ⇒
|  ¬match(lnk(kind(e));i;time(e))
⊢  index(e) ∈ ℕ||sends(lnk(kind(e));sender(e))||
| by Unfold `w-index` 0 THEN Unfolds [`w-sends`;`w-sender`] 0
|    THEN
|    Reduce 0
|    THEN
|    Thin -1
|    THEN
|    MoveToConcl -1
|    THEN
```

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|    GenConcl (mu(λt.match(lnk(kind(e));t;time(e))) = t)
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| 1. the_w : World
| 2. e : E
| 3. FairFifo
| 4. isrcv(kind(e))
| 5. n : ℕtime(e)
| 6. match(lnk(kind(e));n;time(e))
| ⊢  ∃n:ℕ. (λt.match(lnk(kind(e));t;time(e)))(n)
|   by Reduce 0 THEN InstConcl [n]
|
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. 1. the_w : World
. 2. e : E
. 3. FairFifo
. 4. isrcv(kind(e))
. 5. n : ℕtime(e)
. 6. match(lnk(kind(e));n;time(e))
. 7. t : ℕ
. 8. mu(λt.match(lnk(kind(e));t;time(e))) = t
. ⊢  match(lnk(kind(e));t;time(e))
.    ⇒
.    ||rcvs(lnk(kind(e));time(e))||-||snds(lnk(kind(e));t)||
.    ∈ ℕ||onlnk(lnk(kind(e));m(source(lnk(kind(e)));t))||
.   by Analyze 0
.      THEN
.      RW0
.      Thm* ∀the_w:World, l:IdLnk, t,t':ℕ.
.           match(l;t;t')
.           ⟺
.           ||snds(l;t)||≤||rcvs(l;t')||
.           & ||rcvs(l;t')||<||snds(l;t)||+||onlnk(l;m(source(l);t))||
.      {assert_DASH_w_DASH_match}
.      -1
END
```