```
hexists_def  THM

⊢  ∀'a:S. equal(exists,λP:'a → hbool. P(select(P)))
| by Simpset [‘hol_to_nuprl‘]
|
⊢  ∀'a:S. (λp:'a→𝔹. ∃b x:'a. (p(x))) =b (λP:'a→𝔹. P(@b x:'a. (P(x))))
| by HN THEN Simp THEN StrongAuto
|
1. 'a : S
⊢  (λp:'a→𝔹. ∃b x:'a. (p(x))) = (λP:'a→𝔹. P(@b x:'a. (P(x))))
| by Simpset [‘ext‘] THEN Simp THEN StrongAuto
|
1. 'a : S
2. P : 'a→𝔹
⊢  (∃b x:'a. (P(x))) = P(@b x:'a. (P(x)))
| by Simpset [‘bequal‘] THEN Simp THEN StrongAuto
|
|\
| 1. 'a : S
| 2. P : 'a→𝔹
| 3. ∃x:'a. P(x)
| ⊢  P(@b x:'a. (P(x)))
| | by Unab [‘bchoose‘] THEN StrongAuto
| |    THEN
| |    Try (Complete (Unfold ‘label‘ 0))
| |
| 1. 'a : S
| 2. P : 'a→𝔹
| 3. ∃x:'a. P(x)
| ⊢  P(@x:'a. (P(x)))
|   by Inst
|      Thm* ∀'a:S, P,Q:('a→Prop).
|           (∀x:'a. Q(x) ⇒ P(x)) ⇒ (∃x:'a. Q(x)) ⇒ P(@x:'a. Q(x))
|      {choose_elim_pos}
|      ['a;λx.P(x);λx.P(x)]
|      THEN
|      Unab [‘so_apply‘]
|      THEN
|      All Reduce
|      THEN
|      StrongAuto
|      THEN
|      Try (Complete (Unfold ‘label‘ 0))
|
.\
. 1. 'a : S
. 2. P : 'a→𝔹
. 3. P(@b x:'a. (P(x)))
. ⊢  ∃x:'a. P(x)
.   by DTerm (@b x:'a. (P(x))) 0 THEN StrongAuto
.      THEN
.      Try (Complete (Unfold ‘label‘ 0))
END
```