```
hcomma_def  THM

⊢  ∀'a,'b:S.
|  all
|  (λx:'a. all
|          (λy:'b. equal
|                  (pair(x,y)
|                  ,select
|                   (λp:hprod('a; 'b). equal
|                                      (rep_prod(p)
|                                      ,mk_pair(x,y))))))
| by HN THEN Try (Complete (Auto THEN Unfold `label` 0))
|
⊢  ∀'a,'b:S, x:'a, y:'b.
|  <x,y> = (@b x@0:hprod('a; 'b). ((rep_prod(x@0)) =b (mk_pair(x,y))))
| by Unfold `bchoose` 0
|
⊢  ∀'a,'b:S, x:'a, y:'b.
|  <x,y> = (@x@0:hprod('a; 'b). ((rep_prod(x@0)) =b (mk_pair(x,y))))
| by Auto
|
1. 'a : S
2. 'b : S
3. x : 'a
4. y : 'b
⊢  <x,y> = (@x@0:hprod('a; 'b). ((rep_prod(x@0)) =b (mk_pair(x,y))))
| by Unab [`hrep_prod`;`hmk_pair`] THEN ChooseDC
|    THEN
|    Try (Unfold `label` 0)
|
|\
| 1. 'a : S
| 2. 'b : S
| 3. x : 'a
| 4. y : 'b
| 5. x@0 : hprod('a; 'b)
| 6. (λa:'a. λb:'b. (a =b 1of(x@0))∧2(b =b 2of(x@0)))
| |  =b (λa:'a. λb:'b. (a =b x)∧2(b =b y))
| ⊢  <x,y> = x@0
| | by Simp THEN Last (EquandMap (λf.f(x,y)) 𝔹) THEN Simp
| |    THEN
| |    StrongAuto
| |
| 1. 'a : S
| 2. 'b : S
| 3. x : 'a
| 4. y : 'b
| 5. x@0 : hprod('a; 'b)
| 6. (λa:'a. λb:'b. (a =b 1of(x@0))∧2(b =b 2of(x@0)))
|    =
|    (λa:'a. λb:'b. (a =b x)∧2(b =b y))
| 7. x = 1of(x@0)
| 8. y = 2of(x@0)
| ⊢  <x,y> = x@0
|   by Analyze 5 THEN Simp THEN StrongAuto THEN Analyze
```

```
|      THEN
|      StrongAuto
|      THEN
|      Try (Complete (Unfold `label` 0))
|
.\
. 1. 'a : S
. 2. 'b : S
. 3. x : 'a
. 4. y : 'b
. ⊢  ∃x@0:hprod('a; 'b).
.    (λa:'a. λb:'b. (a =b 1of(x@0))∧2(b =b 2of(x@0)))
.    =b (λa:'a. λb:'b. (a =b x)∧2(b =b y))
.   by ((DTerm <x,y> 0) THEN (Unab [`hrep_prod`;`hmk_pair`]))
.      THEN
.      Simp
.      THEN
.      StrongAuto
END
```