Inference at $*$ 1 2 1 2 1 1 2
of proof for Lemma fast-fib:

1. n : $\mathbb{Z}$
2. $0 < n$
3. $\forall a$, b:$\mathbb{N}$.
   $\{m$:$\mathbb{N}$ |
   $\forall k$:$\mathbb{N}$.
   $(a = \mathrm{fib}(k))$
   $\Rightarrow ((k \leq 0) \Rightarrow (b = 0))$
   $\Rightarrow ((0 < k) \Rightarrow (b = \mathrm{fib}(k$ - $1)))$
   $\Rightarrow (m = \mathrm{fib}((n$ - $1)+k))\}$
4. a : $\mathbb{N}$
5. b : $\mathbb{N}$
6. $\forall b_1$:$\mathbb{N}$.
   $\{m$:$\mathbb{N}$ |
   $\forall k$:$\mathbb{N}$.
   $(a+b = \mathrm{fib}(k))$
   $\Rightarrow ((k \leq 0) \Rightarrow (b_1 = 0))$
   $\Rightarrow ((0 < k) \Rightarrow (b_1 = \mathrm{fib}(k$ - $1)))$
   $\Rightarrow (m = \mathrm{fib}((n$ - $1)+k))\}$
7. m : $\mathbb{N}$
8. $\forall k$:$\mathbb{N}$.
   $(a+b = \mathrm{fib}(k))$
   $\Rightarrow ((k \leq 0) \Rightarrow (a = 0))$
   $\Rightarrow ((0 < k) \Rightarrow (a = \mathrm{fib}(k$ - $1)))$
   $\Rightarrow (m = \mathrm{fib}((n$ - $1)+k))$
9. k : $\mathbb{N}$
10. $a = \mathrm{fib}(k)$
11. $(k \leq 0) \Rightarrow (b = 0)$
12. $(0 < k) \Rightarrow (b = \mathrm{fib}(k$ - $1))$
13. $\neg(k = 0)$

$\vdash a+b = \mathrm{fib}(k+1)$

by (RecUnfold ‘fib‘ 0)
CollapseTHEN (((if (0
) =0 then SplitOnConclITE else SplitOnHypITE (0))·)
CollapseTHEN (Auto’)·)·

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14. $\neg(k+1 = 0)$
15. $\neg(k+1 = 1)$

$\vdash$ $a+b = \mathrm{fib}((k+1)$ - $1)+\mathrm{fib}((k+1)$ - $2)$

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http://www.nuprl.org/FDLcontent/p0_963683_/p25_480536_{fast-fib}1_2_1_2_1_1_2.html