owes_ack-2-ff[11,40]

$\forall es$:ES, ff:FIFO, is_req, is_ack:(E$\rightarrow \mathbb{P}$), $awaiting$, $owes\_ack$:(Id$\rightarrow$Id$\rightarrow$Id).
(ff.C $\subseteq$r Id)
$\Rightarrow$ ($\forall i$, j:ff.C. @i($awaiting(i,j)$:$\mathbb{B}$) & @i($owes\_ack(i,j)$:$\mathbb{B}$))
$\Rightarrow$ ($\forall i$:ff.C, e:E. (ff.R(i,e)) $\Rightarrow$ (loc(e) = $i \in$ Id))
$\Rightarrow$ ($\forall e$:E. Dec($is\_req(e)$) & Dec($is\_ack(e)$))
$\Rightarrow$ ($\forall i$, j:ff.C, e:E. Dec(ff.S(i,j,e)))
$\Rightarrow$ ($\forall i$, j:ff.C, e:E. (ff.S(i,j,e)) $\Rightarrow$ (loc(e) = $i \in$ Id))
$\Rightarrow$ plus-ify{i:l}(es;ff;is_req;is_ack;$awaiting$;$owes\_ack$)
$\Rightarrow$ ($\forall sndr$, $rcvr$:ff.C, e:E.
  (loc(e) = $rcvr \in$ Id)
  $\Rightarrow$ (($owes\_ack(rcvr,sndr)$ when e) = tt $\in \mathbb{B}$)
  $\Rightarrow$ (($owes\_ack(rcvr,sndr)$ after e) = ff $\in \mathbb{B}$)
  $\Rightarrow$ [e: $rcvr$ $--is\_ack\rightarrow$ $sndr$])

---

http://www.nuprl.org/FDLcontent/p0_963683_/p116_247264_{owes_ack-2-ff}.html