

es-first-at-since^{11,40}

$$\begin{aligned} & \text{es-first-at-since}(es; i; e; e.R(e); e.P(e)) \\ \equiv_{\text{def}} & \text{loc}(e) = i \\ & \quad \& P(e) \& (\neg R(e)) \\ & \quad \& (\forall e' < e. P(e') \Rightarrow (\exists e'' : \mathbb{E}. (e' \leq_{\text{loc}} e'' \& (e'' <_{\text{loc}} e) \& R(e'')))) \end{aligned}$$

clarification:

$$\begin{aligned} & \text{es-first-at-since}(es; i; e; e.R(e); e.P(e)) \\ \equiv_{\text{def}} & \text{es-loc}(es; e) = i \in \text{Id} \\ & \quad \& P(e) \& (\neg R(e)) \\ & \quad \& \text{alle-lt}(es; e; e'.P(e')) \\ & \quad \Rightarrow (\exists e'' : \text{es-E}(es). (\text{es-le}(es; e'; e'') \& \text{es-locl}(es; e''; e) \& R(e''))) \end{aligned}$$