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(iii)

$(s, \underline{\#}w) \vdash^*_M (h, \underline{\#}w\#w^R)$, $x \notin \Sigma_0, w \in \Sigma_0^*$

TM	Condition	Next TM
$>R_\# L$	$\sigma \neq \#$	$x.R_\# R_\#.\sigma.L_x.\sigma.A$
	$\sigma = \#$	h
$A = L$	$\sigma \neq \#$	$x.R_\#.R_\#.\sigma.L_x.\sigma.A$
	$\sigma = \#$	h

(iv) $(s, \underline{\#}w) \vdash^*_M (h, \underline{\#}a^n b^n)$ where the number of a's and b's are both equal to a fixed integer $n > 0$.

TM	Condition	Next TM
$>R_a.x.R_\# R_\#.a.L_\#.L_{\{a,\#\}}$	$\sigma = a$	$x.R_\#.R_\#.a.A$
	$\sigma = \#$	B
$A = L_\# L_{\{a,\#\}}$	$\sigma = a$	$x.R_\# R_\#.a.A$
	$\sigma = \#$	B
$B = R_b.x.R_\#.R_\#.b.L_\#.L_{\{b,\#\}}$	$\sigma = b$	$x.R_\#.R_\#.b.C$
	$\sigma = \#$	D
$C = L_\# L_{\{b,\#\}}$	$\sigma = b$	$x.R_\#.R_\#.b.C$
	$\sigma = \#$	D
$D = R$	$\sigma = x$	$\#.D$
	$\sigma = \#$	h