Preparation
Step 1: if multiple accept states. add new accept state
Step 2: add extra transitions (and states) if necessary to ensure empty stack at accept
Step 3: ensure each transition is either a push or a pull

Rule Generation Step 1

For all p and q, and where there is a push of some u leaving p and a pop of that same u leaving some s
add rule $A_{pq} \rightarrow aA_{rs}b$

Note: you can skip all states s that clearly do not have a path from r, as that $A_{rs}$ is $\phi$

Rule Generation Step 2: For all p,q,r add $A_{pq} \rightarrow A_{pr}A_{rq}$

Note: again skip any combination where there is clearly no path, as that is $\phi$

Rule Generation Step 3: For all p add $A_{pp} \rightarrow \varepsilon$
What About Self Loops that Push?

$a, \epsilon \rightarrow u$

Answer: make state $r = \text{state } p$

add rule $A_{pq} \rightarrow aA_{ps}b$