input : model instance $\mathcal{M}$, at time t
output: $\mathcal{M}'(t, \mathcal{M})$

for $i \leftarrow 1$ **to** j **do**
  calculate $\sigma_l^{(j)}$;
end
for $i \leftarrow 1$ **to** V **do**
  approximate initial junction fluid pressure $\mathcal{J}$;
end
while $\left|\sum_1^V \left(\mathcal{J}_{n+1}^i - \mathcal{J}_n^i\right)\right| > \textit{some tolerance}$ **do**
  for $i \leftarrow 1$ **to** V **do**
    $\mathcal{J}_{n+1}^i \leftarrow$ newton method for junctions with $\mathcal{J}_n^i$;
  end
end
for $i \leftarrow 1$ **to** E **do**
  $k \leftarrow$index value of E_i first ODEs;
  $\mathcal{M}'_{i,\ldots,i+k} \leftarrow \mathcal{F}_i(t, \mathcal{M}_{i,\ldots,i+k})$;
end