APPENDIX A: REVERSIBLE TRIPLET TRANSFER

In this section we will derive the IET equations for the problem at hand. From the general equations (2.1), (2.2) and (2.3), one may obtain the following IET equations for N_S, P and N_T:

$$\begin{aligned}
\dot{N}_S &= -\frac{N_S}{\tau_S} - c\int_o^t R^*(t-\tau)N_S(\tau)d\tau + \int_0^t R^\sharp(t-\tau)P^2(\tau)d\tau + c\int_0^t R^\clubsuit(t-\tau)N_T(\tau)d\tau, \\
\dot{P} &= c\int_0^t R^\dagger(t-\tau)N_S(\tau)d\tau - \int_0^t R^\ddagger(t-\tau)P^2(\tau)d\tau + c\int_0^t R^\diamondsuit(t-\tau)N_T(\tau)d\tau, \qquad \text{(A1)} \\
\dot{N}_T &= -\frac{N_T}{\tau_T} + c\int_0^t R^\heartsuit(t-\tau)N_S(\tau)d\tau + \int_0^t R^\spadesuit(t-\tau)P^2(\tau)d\tau - c\int_0^t R^\star(t-\tau)N_T(\tau)d\tau.
\end{aligned}$$

The kernels from (A1) can be expressed via the elements of $\hat{R}$ as follows:

$$\begin{aligned}
&R^* = -\hat{R}_{11}, \quad R^\sharp = \frac{1}{4}\hat{R}_{12} + \frac{3}{4}\hat{R}_{13}, \quad R^\clubsuit = \hat{R}_{14}, \qquad \text{(A2)} \\
&R^\dagger = \hat{R}_{21} + \hat{R}_{31}, \quad R^\ddagger = -\left(\frac{1}{4}(\hat{R}_{22} + \hat{R}_{32}) + \frac{3}{4}(\hat{R}_{23} + \hat{R}_{33})\right), \quad R^\diamondsuit = \hat{R}_{24} + \hat{R}_{34}, \\
&R^\heartsuit = \hat{R}_{41}, \quad R^\spadesuit = \frac{1}{4}\hat{R}_{42} + \frac{3}{4}\hat{R}_{43}, \quad R^\star = -\hat{R}_{44}.
\end{aligned}$$

There are the following contact expressions for these kernels:

$$\begin{aligned}
&\tilde{R}^* = k_f\left(4 + g_0^2 k_c k_{-t} + g_1(3k_c + k_t) + g_0(k_c + 3k_t + 4k_{-t} + 3g_1 k_c k_{-t} + 4g_1 k_c k_t)\right)/Y, \qquad \text{(A3)} \\
&\tilde{R}^\sharp = k_b(1 + g_0 k_{-t} + g_1 k_t)/Y, \quad \tilde{R}^\clubsuit = (g_0 - g_1)k_b k_{-t}/Y, \quad \tilde{R}^\dagger = 4k_f(1 + g_0 k_{-t} + g_1 k_t)/Y, \\
&\tilde{R}^\ddagger = \left(k_b(1 + g_0 k_{-t} + 4g_1 k_t) + (1 + g_s k_f)(3k_t + k_c + g_0 k_c k_{-t} + 4g_1 k_c k_t)\right)/Y, \\
&\tilde{R}^\diamondsuit = 4k_{-t}\left((1 + g_s k_f)(1 + g_1 k_c) + g_1 k_b\right)/Y, \quad \tilde{R}^\heartsuit = 3(g_0 - g_1)k_f k_t/Y, \\
&\tilde{R}^\spadesuit = 3k_t\left((1 + g_s k_f)(1 + g_1 k_c) + g_1 k_b\right)/Y, \\
&\tilde{R}^\star = k_{-t}\left((1 + g_s k_f)(4 + g_0 k_c + 3g_1 k_c) + k_b(g_0 + 3g_1)\right),
\end{aligned}$$

where

$$\begin{aligned}
Y =& (1 + g_0 k_{-t})\left[(1 + g_s k_f)(4 + g_0 k_c + 3g_1 k_c) + k_b(g_0 + 3g_1)\right] \qquad \text{(A4)} \\
&+ \left[(1 + g_s k_f)(g_1 + 3g_0 + 4g_0 g_1 k_c) + 4g_0 g_1 k_b\right] k_t.
\end{aligned}$$