1 Starting from eq. 73.2 in the lecture notes, and taking derivatives with respect to A^a show that:

a The two point 1PI function for the photon (the photon self energy), $\Pi_{\mu\nu}$, satisfies:

$$k^\mu \Pi_{\mu\nu}(k) = 0$$

b The 1PI function with n ≥ 3 photon legs satisfies:

$$k^{\mu_1} \Gamma^{(n)}_{\mu_1,\ldots,\mu_n}(k^{(1)},\ldots,k^{(n)}) = 0$$

2 Read section 8.4.1 of Itzykson-Zuber QFT book (where the W.T. identities are derived without reference to the Lagrangian or Gauge-Fixing, but instead buy imposing current conservation for operators)