$$\frac{\mathrm{d}S}{d\tau} = \epsilon(1-p) - R_0 SI - \epsilon S \tag{1}$$
$$\frac{\mathrm{d}I}{d\tau} = R_0 SI + \epsilon p - I \tag{2}$$

So to find the E.E. Letting both equal to 0, solve get:

$$S = \frac{\epsilon(1-p)}{R_0 - 1}, I = \frac{p(\ R_0 - 1)}{R_0 p - 1} \tag{3}$$

Jacobian is the following.

$$\mathcal{J} = \begin{bmatrix} -R_0 I - \epsilon & -R_0 S \\ -R_0 I & -R_0 S - 1 \end{bmatrix} \tag{4}$$

Thus when at E.E., the corresponding Jacobian becomes,

$$\mathcal{J}|_{E.E.} = \begin{bmatrix} \frac{R_0 p - R_0^2 p - \epsilon R_0 p + \epsilon}{R_0 p - 1} & \frac{R_0(1-p)}{R_0 - 1} \\ \frac{-R_0 p(R_0 - 1)}{R_0 p - 1} & \frac{R_0 p - 2R_0 + 1}{R_0 - 1} \end{bmatrix} \tag{5}$$