According to equation (11) in the paper.

$$P = \frac{G - \frac{1-\psi}{z}}{\psi/z} = \frac{zG - 1 + \psi}{\psi} = \frac{z}{\psi}G - \frac{1}{\psi} + 1$$

With $\zeta = 0$, also WLOG set $\eta = 1$, according to equation (12) & (13) (plug in $t = \frac{1}{z\psi}$):

$$P = 1 + \frac{1}{z\psi}[1 + (P-1)\phi][1 + (P-1)\psi]$$

Let $Q = P - 1$:

$$Q = P - 1 = \frac{z}{\psi}G - \frac{1}{\psi}$$

Rearrange the previous equation:

$$Q \cdot z\psi = (1 + Q\phi)(1 + Q\psi) = 1 + Q(\phi + \psi) + Q^2\phi\psi$$

$$\phi\psi Q^2 + (\phi + \psi - z\psi)Q + 1 = 0$$

Now plug in Q with z, ψ, G:

$$\phi\psi\left(\frac{z^2}{\psi^2}G^2 - \frac{2z}{\psi^2}G + \frac{1}{\psi^2}\right) + \frac{z\phi}{\psi}G + zG - zG - \frac{\phi}{\psi} - 1 + z + 1 = 0$$

$$\left(\frac{\phi z^2}{\psi}\right)G^2 + \left(\frac{z\phi}{\psi} + z - z^2 - \frac{2z}{\psi^2}\right) \cdot \phi\psi G + \frac{\phi}{\psi} - \frac{\phi}{\psi} - 1 + 1 + z = 0$$

$$\frac{\phi z^2}{\psi}G^2 + \left(z[1 - \frac{\phi}{\psi} - z]\right)G + z = 0 \quad (\star)$$

$(\star)$ times $\frac{\psi}{\phi z}$ to generate our target equation:

$$zG^2 + \left(\frac{\psi}{\phi} - 1 - \frac{z\psi}{\phi}\right)G + \frac{\psi}{\phi} = 0$$

$$zG^2 + \left((1-z)\frac{\psi}{\phi} - 1\right)G + \frac{\psi}{\phi} = 0$$

Here we have something "strange", as the our desired equation is

$$zG^2 + \left((1 - \frac{\psi}{\phi})z - 1\right)G + \frac{\psi}{\phi} = 0$$

Is it a possible typo?