The differential operator notation used in this document is 'D', not 'p'.

$$\psi_{d0}\Delta_{\delta}(t)+\frac{\psi_{q0}\mathrm{D}\Delta_{\delta}(t)}{\omega_0}=\frac{\mathrm{D}\Delta_{\psi_d}(t)}{\omega_0}-\Delta_{\psi_q}(t) \qquad \text{(e5.9)}$$

$$\Delta_{\delta}(t)=\frac{\dfrac{\mathrm{D}\Delta_{\psi_d}(t)}{\omega_0}-\Delta_{\psi_q}(t)}{\psi_{d0}+\dfrac{\psi_{q0}\mathrm{D}}{\omega_0}} \qquad \text{(e5.11)}$$

$$\psi_{q0}\Delta\delta=\frac{1}{\omega_0}p\left(\Delta\psi_q\right)+\Delta\psi_d+\psi_{d0}\frac{1}{\omega_0}p(\Delta\delta) \qquad \text{(e5.10)}$$

$$\Delta_{\psi_d}(t)=\psi_{q0}\Delta_{\delta}(t)-\frac{\mathrm{D}\Delta_{\psi_q}(t)}{\omega_0}-\frac{\psi_{d0}\mathrm{D}\Delta_{\delta}(t)}{\omega_0} \qquad \text{(e5.12)}$$

Substituting Equation (e5.12) in (e5.11), rearranging and simplifying:

$$\Delta_{\delta}(t)=\frac{\psi_{q0}\mathrm{D}\Delta_{\delta}(t)}{\left(\psi_{d0}+\dfrac{\psi_{q0}\mathrm{D}}{\omega_0}\right)\omega_0}-\frac{\mathrm{D}^2\Delta_{\psi_q}(t)}{\left(\psi_{d0}+\dfrac{\psi_{q0}\mathrm{D}}{\omega_0}\right)\omega_0^2}-\frac{\mathrm{D}^2\psi_{d0}\Delta_{\delta}(t)}{\left(\psi_{d0}+\dfrac{\psi_{q0}\mathrm{D}}{\omega_0}\right)\omega_0^{\ 2}}-\frac{\Delta_{\psi_q}(t)}{\psi_{d0}+\dfrac{\psi_{q0}\mathrm{D}}{\omega_0}} \qquad \text{(e5.13p)}$$

The derivative of constant is 0 and the D and D^2 terms can be ignored, then the expression above becomes:

$$\psi_{d0}\Delta\delta=-\Delta\psi_q \qquad \text{(e5.13)}$$