$$d\,\overbrace{\omega^g \otimes 1 + 1 \otimes \omega} = \underbrace{d\omega^g} \otimes 1 + 1 \otimes \underbrace{d\omega}$$

$$\underbrace{d\,\overbrace{\omega^g \otimes 1 + 1 \otimes \omega}}_{\sigma\sigma'} = \underbrace{\omega^g \otimes 1 + 1 \otimes \omega}_{\sigma} \star \underbrace{\omega^g \otimes 1 + 1 \otimes \omega}_{\sigma'} - \underbrace{\omega^g \otimes 1 + 1 \otimes \omega}_{\sigma \star \sigma'} =$$

$$\overbrace{\omega_\sigma^g \otimes 1 + 1 \otimes \omega_\sigma} \star \overbrace{\omega_{\sigma'}^g \otimes 1 + 1 \otimes \omega_{\sigma'}} - \omega^g_{\sigma \star \sigma'} \otimes 1 - 1 \otimes \omega_{\sigma \star \sigma'} =$$

$$\overbrace{\omega_\sigma^g \star \omega_{\sigma'}^g} \otimes 1 - \overbrace{\omega^g_{\sigma \star \sigma'}} \otimes 1 + 1 \otimes \overbrace{\omega_\sigma \star \omega_{\sigma'}} - 1 \otimes \omega_{\sigma \star \sigma'} +$$

$$\omega_\sigma^g \otimes \omega_{\sigma'} + \omega_{\sigma'}^g \otimes \omega_\sigma - \omega_{\sigma'}^g \otimes \omega_\sigma - \omega_\sigma^g \otimes \omega_{\sigma'} = \underbrace{d\omega^g}_{\sigma \star \sigma'} \otimes 1 + 1 \otimes \underbrace{d\omega}_{\sigma \star \sigma'}$$