$$U_{g^{-1}} \underline{U_w \mathbb{1}} = U_{wg} \underbrace{{}^w \overset{*}{U}_g \mathbb{1}}$$

$$U_{g^{-1}} \underline{U_w B^n_{-\omega}} = \overset{n}{\overleftarrow{a + \underline{w + \omega}c}}{}^* U_{wg} B^n_{-\omega\, {}^w U_g}$$

$$U_{g^{-1}} \underline{U_w B^n_{-\omega}} = U_{wg} \underbrace{{}^w \overset{*}{U}_g B^n_{-\omega}} = \overset{n}{\overleftarrow{a + \underline{w + \omega}c}}{}^* U_{wg} B^n_{-\omega\, {}^w U_g}$$

$$U_{g^{-1}} \underline{U_{wK+} G^n_0} = \overset{n}{\overleftarrow{a + wc}}{}^* U_{wg\ K+} G^n_0$$

$$U_{g^{-1}} \underline{U_{wK+} G^n_0} = U_{wg} \underbrace{{}^w \overset{*}{U}_{gK+} G^n_0} = U_{wg} \underbrace{{}_{K+} G^n_0 \overset{n}{\overleftarrow{a + wc}}}{}^* = \overset{n}{\overleftarrow{a + wc}}{}^* U_{wg\ K+} G^n_0$$

$$\dot{x}\ {}^x \underline{\det} = \ \mathrm{tr}\ \underline{\overset{-1}{x}} \dot{x}\ {}^x \det$$

$$U_{g^{-1}} \underline{U_{wK+} G^n_0 \dot\omega} = \overset{n}{\overleftarrow{a + wc}}{}^* U_{wg\ K+} \overbrace{\underline{G^n_0 \dot\omega}{}^w \underline{g}} + n \overbrace{\overset{-1}{\overleftarrow{a + wc}}\dot\omega c}_{*}$$

$$U_{g^{-1}} \underline{U_{wK+} G^n_\omega \dot\omega} = \overset{n}{\overleftarrow{a + \underline{w + \omega}c}}{}^* U_{wg\ K+} G^n_{\omega\, {}^w U_g} \dot\omega\ {}^{\omega w} \underline{U_g} + n \overset{n-1}{\overleftarrow{a + \underline{w + \omega}c}}{}^* \overleftarrow{a + \underline{w + \omega}c}\ \overbrace{\overset{-1}{\overleftarrow{a + \underline{w + \omega}c}}\dot\omega c}_{*} U_{wg} B^n_-$$

$$0\ {}^w U_g = 0$$

$${}^{0w} \underline{U_g} = {}^w \underline{g}$$

$$\underline{{}^{0}_{z}U_g} = {}^{z}\underline{g} = \underline{{}^{z0}U_g}$$

$$\underline{{}^{0}_{z}U_g} = \underline{{}^{0}\mathfrak{t}^{z}g\,\mathfrak{t}^{-1zg}} = {}^{0}\underline{\mathfrak{t}}^{z}\,{}^{z}\underline{g}\,{}^{zg}\underline{\mathfrak{t}}^{-1zg} = {}^{z}\underline{g}$$

$${}^{0}U_g = g\,\mathfrak{t}^{-1}{}^{0\cdot g}$$

$$\left(\underline{z+\zeta,\overset{*}{w}}\right)\left(\underbrace{\underline{(z+\zeta)\,\overset{*}{w}}}_{-1}\,(z+\zeta)\,\overset{*}{\omega} + \underbrace{\underline{z\overset{*}{w},}z\overset{*}{\omega}}_{-1}\right) = \underline{z+\zeta,}\overset{*}{w} - (z+\zeta)\,\overset{*}{\omega} + \left(z\overset{*}{w} - \zeta\overset{*}{w}\right)\underbrace{\underline{z\overset{*}{w},}z\overset{*}{\omega}}_{-1}$$

$$= \underline{z+\zeta,}\overset{*}{w} - (z+\zeta)\,\overset{*}{\omega} + -z\overset{*}{\omega} - \zeta\overset{*}{w}\underbrace{\underline{z\overset{*}{w},}z\overset{*}{\omega}}_{-1} = z\overset{*}{w} - \zeta\overbrace{\overset{*}{w}+\overset{*}{\omega}+\overset{*}{w}\underline{z\overset{*}{w},}z\overset{*}{\omega}}$$

$$= \underline{z\overset{*}{w}}\left(\underbrace{\underline{z\overset{*}{w},}\zeta\,\underline{z\overset{*}{w}}}_{-1}\left(\underbrace{\underline{z\overset{*}{w},}\underline{\overset{*}{w}+\overset{*}{\omega}}}_{-1} + \overset{*}{w}z\overset{*}{\omega}\right)\right) = \underline{z\overset{*}{w}}\left(\underline{\zeta^{z}B_w^{-1},}\underline{\overset{*}{w}+\overset{*}{\omega}} - \overset{*}{w}z\overset{*}{\omega}\right)$$