

$$\overline{\mathfrak{b}R_g\mathfrak{t}R_g}{}^g\widetilde{\nabla}\mathfrak{q}=\mathfrak{b}\mathfrak{x}\mathfrak{t}+\frac{1}{2}\overline{\mathfrak{b}^+\mathfrak{x}\mathfrak{b}^+}$$

$$\dot{g}_1\dot{g}_2{}^g\widetilde{\nabla}\mathfrak{q}=\dot{g}_1\dot{g}_2{}^g\widehat{d\mathfrak{q}}+\frac{1}{2}\underbrace{\dot{g}_1{}^g\mathfrak{q}}\mathfrak{x}\underbrace{\dot{g}_2{}^g\mathfrak{q}}$$

$$\mathfrak{k}_g=\mathfrak{b}R_g\in G_g$$

$${}^y\overline{\mathfrak{b}|R_g\ltimes\mathfrak{q}}=\mathfrak{k}_y|R_g\ltimes\mathfrak{q}=\mathfrak{k}_y{}^yR^{g\ yg}\mathfrak{q}=\mathfrak{b}R_y{}^yR^{g\ yg}\mathfrak{q}=\mathfrak{b}{}^yR^{yg\ yg}\mathfrak{q}=\mathfrak{b}^+$$

$$\Rightarrow \mathfrak{b}\mathfrak{t}{}^e\overline{dR_g\ltimes\mathfrak{q}}=\mathfrak{k}_e\mathfrak{t}_e{}^e\overline{dR_g\ltimes\mathfrak{q}}={\textstyle\overline{\mathfrak{k}\mathfrak{x}\mathfrak{t}|R_g\ltimes\mathfrak{q}}}_{\text{cst}}-{\textstyle\overline{\mathfrak{t}\mathfrak{x}\mathfrak{k}|R_g\ltimes\mathfrak{q}}}_{\text{cst}}-{\textstyle\overline{\mathfrak{k}\mathfrak{x}\mathfrak{t}|R_g\ltimes\mathfrak{q}}}_{\mathfrak{b}\mathfrak{x}\mathfrak{t}}=-\mathfrak{b}\mathfrak{x}\mathfrak{t}^+$$

$$\begin{aligned}\Rightarrow \text{LHS} &= \overline{\mathfrak{b}R_g\mathfrak{t}R_g}{}^g\widehat{d\mathfrak{q}}+\frac{1}{2}\overline{\mathfrak{b}R_g}{}^g\mathfrak{q}\mathfrak{x}\overline{\mathfrak{b}R_g}{}^g\mathfrak{q} \\ &= \overline{\mathfrak{b}\mathfrak{t}}{}^e\overline{dR_g\ltimes\mathfrak{q}}+\frac{1}{2}\overline{\mathfrak{b}^+\mathfrak{x}\mathfrak{b}^+}=\text{RHS}\end{aligned}$$

$$\begin{array}{ccc} G_g & \xrightarrow[\text{tens}]{\quad {}^g\widetilde{\mathfrak{q}} \quad} & \underline{K} \\ \downarrow \scriptstyle {}^g\overline{K\sqcap} & & \downarrow \scriptstyle g\colon \\ \underline{K\sqcap G}_x & \xrightarrow[\scriptstyle {}^x\mathfrak{q}]{\quad} & \underline{K}\mathfrak{x}x \end{array}$$

$$p\colon \overline{\dot{p}_1\cdots\dot{p}_m}{}^{p\widetilde{\mathfrak{q}}}=\dot{x}_1\cdots\dot{x}_m{}^x\mathfrak{q}$$

$$\dot{p}_1\dot{p}_2{}^{p\widetilde{\Omega}}=\dot{p}_1\dot{p}_2{}^p\widehat{d\mathfrak{q}}+\frac{1}{2}\underbrace{\dot{p}_1{}^{p\widetilde{\mathfrak{q}}}}\mathfrak{x}\underbrace{\dot{p}_2{}^{p\widetilde{\mathfrak{q}}}}$$

$$\begin{aligned}\dot{x}_1\dot{x}_2{}^x\Omega &= \overline{\mathfrak{b}R_g{}^g\pi}\overline{\mathfrak{t}R_g{}^g\pi}{}^{g\pi}\Omega\stackrel{\text{KN}}{76}{}^og\left(\mathfrak{b}R_g\mathfrak{t}R_g{}^g\widetilde{\Omega}\right) \\ &= {}^og\left(\mathfrak{b}R_g\mathfrak{t}R_g{}^g\widetilde{d\Omega}+\frac{1}{2}\overline{\mathfrak{b}R_g}{}^g\mathfrak{q}\mathfrak{x}\overline{\mathfrak{t}R_g}{}^g\mathfrak{q}\right)\end{aligned}$$