$$\P^t = \underline{1-t}\,\P^0 + t\,\P^1$$

$$\int^M \P^1 = \int^M \P^0 \implies \P^1 - \P^0 = d\P$$

$$\iota_{X^t}\P^t = -\P$$

$$-\left({}_{2}\flat_h \cdots {}_{n}\flat_h\right){}^{h}\P = \left(X^t_h : {}_{2}\flat_h \cdots {}_{n}\flat_h\right){}^{h}\P^t = \left(X^t_h : {}_{2}\flat_h \cdots {}_{n}\flat_h\right)\left(\underline{1-t}\,{}^{h}\P^1 + t\,{}^{h}\P^0\right)$$

$$= \underline{1-t}\,\left(X^t_h : {}_{2}\flat_h \cdots {}_{n}\flat_h\right){}^{h}\P^1 + t\left(X^t_h : {}_{2}\flat_h \cdots {}_{n}\flat_h\right){}^{h}\P^0$$

$$= \left(\underline{1-t}\,X^t_h : {}_{2}\flat_h \cdots {}_{n}\flat_h\right){}^{h}\P^1 + \left(t\,X^t_h : {}_{2}\flat_h \cdots {}_{n}\flat_h\right){}^{h}\P^0$$

$$\frac{d}{dt}\underbrace{{}_{0}\mathsf{h}^t \ltimes \P^t} = {}_{0}\mathsf{h}^t \ltimes \left(\frac{d}{dt}\P^t + X^t \ltimes \P^t\right) = {}_{0}\mathsf{h}^t \ltimes \left(\P^1 - \P^0 + \iota_{X^t}\underbrace{d\P^t}_{=0} + d\,\overbrace{\iota_{X^t}\P^t}\right)$$

$$= {}_{0}\mathsf{h}^t \ltimes \left(\P^1 - \P^0 + d\,\overbrace{\iota_{X^t}\P^t}\right) = {}_{0}\mathsf{h}^t \ltimes \left(d\P - d\P\right) = 0$$