$$\flat \bowtie \underline{\natural}_{z \natural} = \flat_z {}^z\underline{\natural}$$

$$\underbrace{\flat \bowtie \underline{\natural}} \ast \underbrace{\flat' \bowtie \underline{\natural}} = \underbrace{\flat \ast \flat'} \bowtie \underline{\natural}$$

$$\mathrm{LHS}_{z \natural} = \flat_z {}^z\underline{\natural} \; \underline{\flat' \bowtie \underline{\natural}}_{z \natural} - \flat'_z {}^z\underline{\natural} \; \underline{\flat \bowtie \underline{\natural}}_{z \natural} = \flat_z {}^z\underline{\natural \bowtie \overbrace{\flat' \bowtie \underline{\natural}}} - \flat'_z {}^z\underline{\natural \bowtie \overbrace{\flat \bowtie \underline{\natural}}}$$

$$= \flat_z {}^z\underline{\flat'_{\sim} {}^{\sim}\underline{\natural}} - \flat_z {}^z\underline{\flat'_{\sim} {}^{\sim}\underline{\natural}} = \flat_z \underline{\flat'}_z {}^z\underline{\natural} + \flat_z \flat'_z {}^z\underline{\underline{\natural}} - \flat'_z \underline{\flat}_z {}^z\underline{\natural} - \flat'_z \flat_z {}^z\underline{\underline{\natural}} = \mathrm{RHS}_{z \natural}$$