Choose
$$\beta := (i \cdot \beta)^{\dagger} \cdot \alpha$$

$$list \alpha \mathbf{z} \quad \exists \beta \quad list \beta \mathbf{x} \quad \alpha_0 \doteq \beta^{\dagger} \cdot \alpha$$
Extend scope of β

$$\exists \beta \quad list \alpha \mathbf{z} \quad list \beta \mathbf{x} \quad \alpha_0 \doteq \beta^{\dagger} \cdot \alpha$$

$$\exists \beta \quad list \alpha \mathbf{z} \quad list \beta \mathbf{x} \quad \alpha_0 \doteq \beta^{\dagger} \cdot \alpha$$

$$\forall \mathbf{z} := \mathbf{z}$$

$$list \alpha \mathbf{z} \quad list \beta \mathbf{y}$$