

## 8. Equivalent representations

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Change of coordinates:

$$z = T(x)$$

$$x = T^{-1}(z)$$

$$\begin{cases} \dot{z} = \frac{\partial T}{\partial x} \Big|_{x=T^{-1}(z)} A T^{-1}(z) + \frac{\partial T}{\partial x} \Big|_{x=T^{-1}(z)} B u(t) \\ \quad = f(z) + g(z)u \\ y = C T^{-1}(z) = h(z) \end{cases}$$

$$\text{if } T(x) = Tx \quad |T| \neq 0 \Rightarrow \begin{aligned} f(z) &= TAT^{-1}z \\ g(z) &= TB \\ h(z) &= CT^{-1}z \end{aligned}$$