$$\begin{cases} \dot{x} = f(x) + g(x) u \\ y = h(x) \end{cases}$$

is said to be passive if $\exists V(x) \geq 0$ storage function such that:

$$\underbrace{V(x(t)) - V(x_0)}_{\text{stored energy}} \leq \int_0^t \underbrace{u(\tau) y(\tau) d\tau}_{\substack{\text{supplied} \\ \text{energy}}} \quad \forall x_0, \forall t, \forall u(\cdot)$$

$$L_f V + h L_g V = \dot{V}(t) \leq u(t) y(t) \quad \forall t, \forall u, \forall x$$

$$a(x) + u b(x) \leq u h(x) \quad \forall u$$

$$L_f V \leq 0 \quad \text{and} \quad L_g V = h(x)$$

the system is Passive if the above condition is satisfied.