From equation (2.6)

$$\delta S = \int_{t_a}^{t_b} \left(-\frac{d}{dt}\frac{\partial L}{\partial \dot{x}} + \frac{\partial L}{\partial x} \right) \delta x(t)\, dt$$

Let $t_a = t_b = s$ to obtain

$$\delta S = \left(-\frac{d}{ds}\frac{\partial L}{\partial \dot{x}} + \frac{\partial L}{\partial x} \right) \delta x(s)$$

Divide through by $\delta x(s)$.

$$\frac{\delta S}{\delta x(s)} = -\frac{d}{ds}\frac{\partial L}{\partial \dot{x}} + \frac{\partial L}{\partial x}$$