$$\lambda A x = x$$
$$x' x = I$$

$$\frac{\partial \lambda}{\partial p} A x + \lambda \frac{\partial A}{\partial p} x + \lambda A \frac{\partial x}{\partial p} = \frac{\partial x}{\partial p}$$
$$\left(\frac{\partial x}{\partial p} \right)' x + x' \frac{\partial x}{\partial p} = 0$$
$$x' \left(\frac{\partial \lambda}{\partial p} A x + \lambda \frac{\partial A}{\partial p} x + \lambda A \frac{\partial x}{\partial p} \right) +$$
$$\left(\frac{\partial \lambda}{\partial p} A x + \lambda \frac{\partial A}{\partial p} x + \lambda A \frac{\partial x}{\partial p} \right)' x = 0$$