with Symmetric Matrix S

$$\frac{\partial}{\partial x}(b - Ax)^T S (b - Ax) = -2A^T S(b - Ax)$$

Think ~

$$\frac{\partial}{\partial x} S\, y(x)^2 = 2S\, y(x) \cdot y'(x)$$

Try: $\frac{\partial}{\partial x}(b - x)^T W (b - x)$:

if not symmetric more weird but don't think you'll need