Title: Derivations with annihilator conditions in prime rings

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Let $R$ be a prime ring of char $R \neq 2$ with a derivation $d$ and $U$ a noncentral Lie ideal. If $a \in R$, such that $au^s(d(u))^nu^t \in Z(R)$ for all $u \in U$ and $s \geq 0$, $t \geq 0$, $n \geq 1$ fixed positive integers, then either $a = 0$ or $R$ satisfies $S_4$, the standard identity in four variables.

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