Let $G$ be a complex reductive group and $V$ a $G$-module. Let $\pi: V \to V/G$ be the quotient morphism and set $\mathcal{N}(V) = \pi^{-1}(\pi(0))$. We consider the following question. Is the null cone $\mathcal{N}(V)$ reduced, i.e., is the ideal of $\mathcal{N}(V)$ generated by $G$-invariant polynomials? We have complete results when $G$ is $\text{SL}_2$, $\text{SL}_3$ or simple of adjoint type and when $G$ is semisimple of adjoint type and the $G$-module is irreducible. (Received September 10, 2011)