We present a first measurement of time-dependent \mathcal{CP} -violation in $B^0 \to D^{*\mp} \rho^{\pm}$, where $D^{*\mp} \to D^0 \pi$. The analysis was performed using the final Belle dataset containing $772 \times 10^6~B\bar{B}$ pairs collected at the KEKB e^+e^- collider. Three D^0 decay modes are analyzed, $K^{\mp}\pi^{\pm}, K^{\mp}\pi^{\pm}\pi^{0}$, and $K^{\mp}\pi^{\pm}\pi^{\mp}\pi^{\pm}$. Since the studied decay is a scalar \to vector vector decay, three helicity configurations are present. Exploiting the helicity configurations via angular analysis, the time-dependent \mathcal{CP} -violation parameters encoding $2\phi_1 + \phi_3$ are obtained from the fit.