FeH, produced by reaction of FeCO$_3$ with H atoms, has been studied by selective laser-induced fluorescence following excitation of single rotational levels of individual spin-orbit components of $v = 0$ of $^3\Pi$. As well as lines of known transitions including $^3\Pi-^3\Delta$, a number of transitions to a new lower state have been recognized. This state lies at about 0.5 eV above the ground state; rotational structure, recorded at high resolution, shows strong R and P branches and very weak Q lines. The apparent value of the rotational constant, $B$, is very small, $\sim 3.5$ cm$^{-1}$, not much more than half of the expected, unperturbed value.

References