The intended function of the circuit is to regulate Vout so that it has a maximum value of ~13-16V, regardless of Vin (and thus V1). Vreg, the output of a fixed 5V voltage regulator, is expected to stay at 5V, so long as Vout is sufficiently high to turn the regulator on. As can be seen from the simulation results, as V1 reaches a high enough value to allow for a threshold drop (~4V) across the M1 MOSFET, Vout begins to sharply rise, but tapers off at about 2.5V. This is an unexpected result. It seems clear that Vout is being shunted through one of the two paths to ground - either the path through the photoisolator, or the path through the resistor pair at the negative terminal to op-amp U3. Clearly the former is the real culprit. We suspect that either the op-amp is wired incorrectly, or that the lack of pump load is drastically changing the behavior of the op-amp. However, without successful simulation results for the pump circuit, we cannot correctly determine the proper input impedance to correctly simulate the pump as a load.