Understanding gravitational wave emission produced by core-collapse supernovae will be essential for their detection with current and future gravitational wave detectors. This requires a sample of waveforms from modern 3D supernova simulations reaching well into the explosion phase, where gravitational wave emission is expected to peak. However, recent waveforms from 3D simulations with multi-group neutrino transport do not reach far into the explosion phase, and some are still obtained from non-exploding models. We therefore calculate waveforms up to 0.9 s after core bounce using the neutrino hydrodynamics code CoCoNuT-FMT. We consider multiple models across the range of possible explosion energies and progenitor masses. Using a Bayesian analysis, we explore the detection and parameter estimation potential for our models in simulated Advanced LIGO, Advanced Virgo, and Einstein Telescope design sensitivity noise.