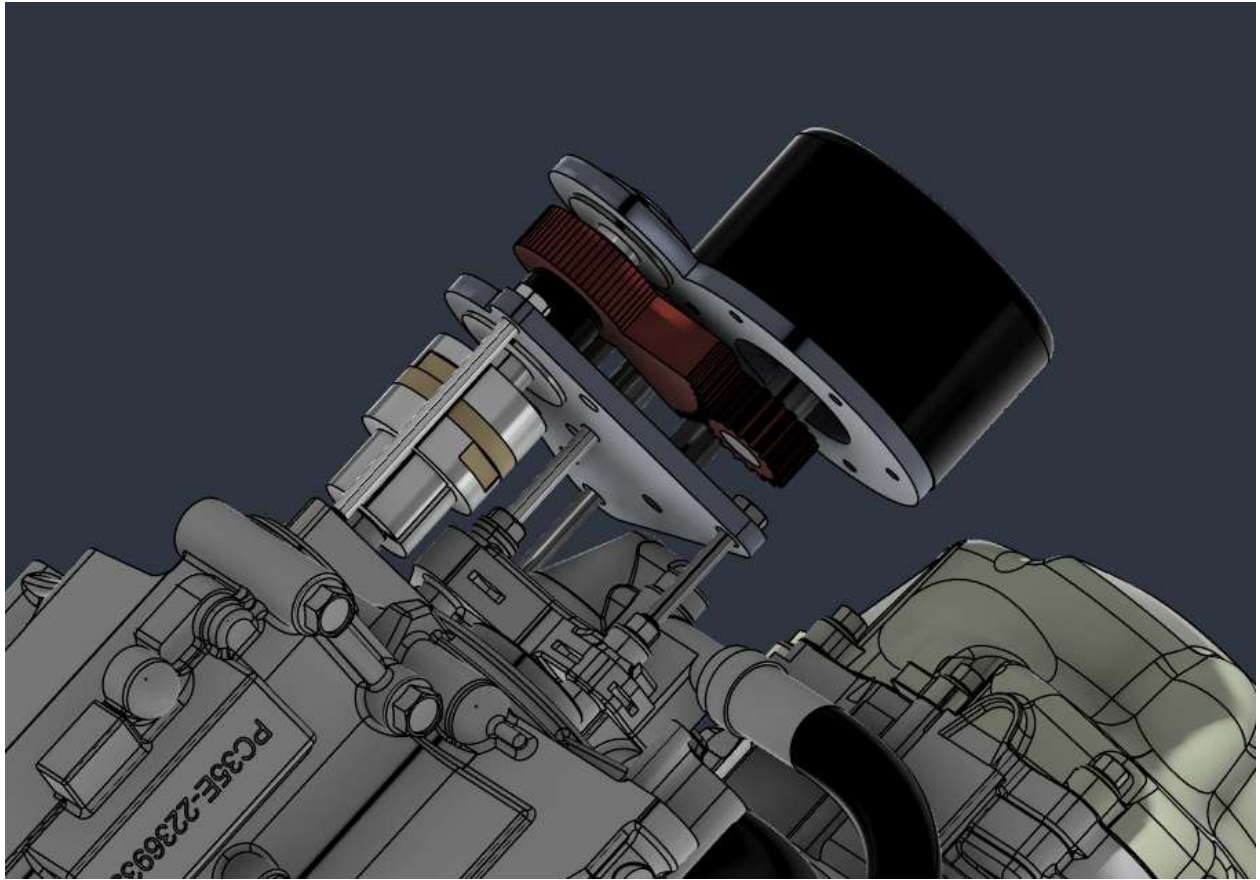
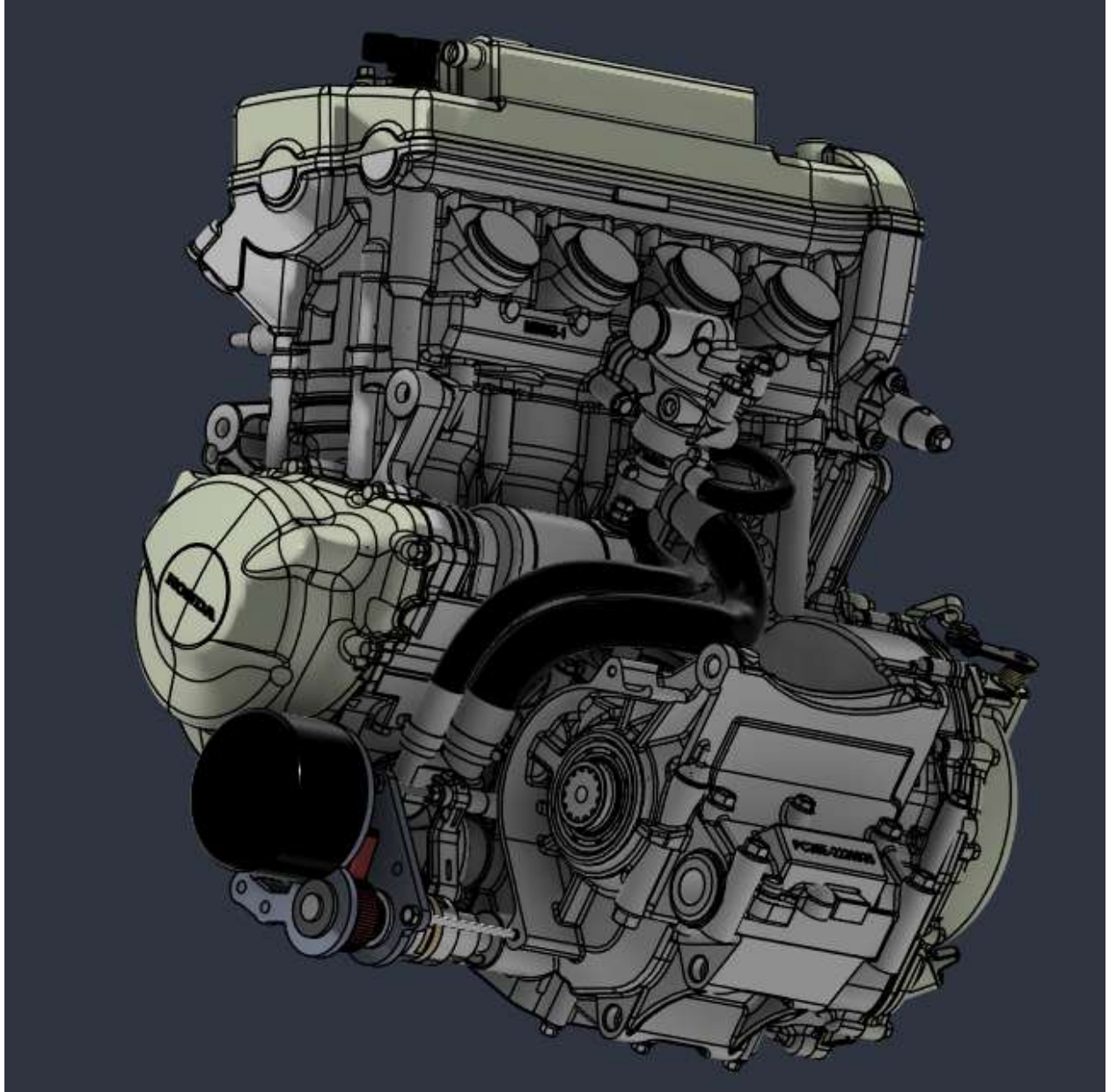


# **An Electric Shifter Concept for Minuteman Racing, 2026**

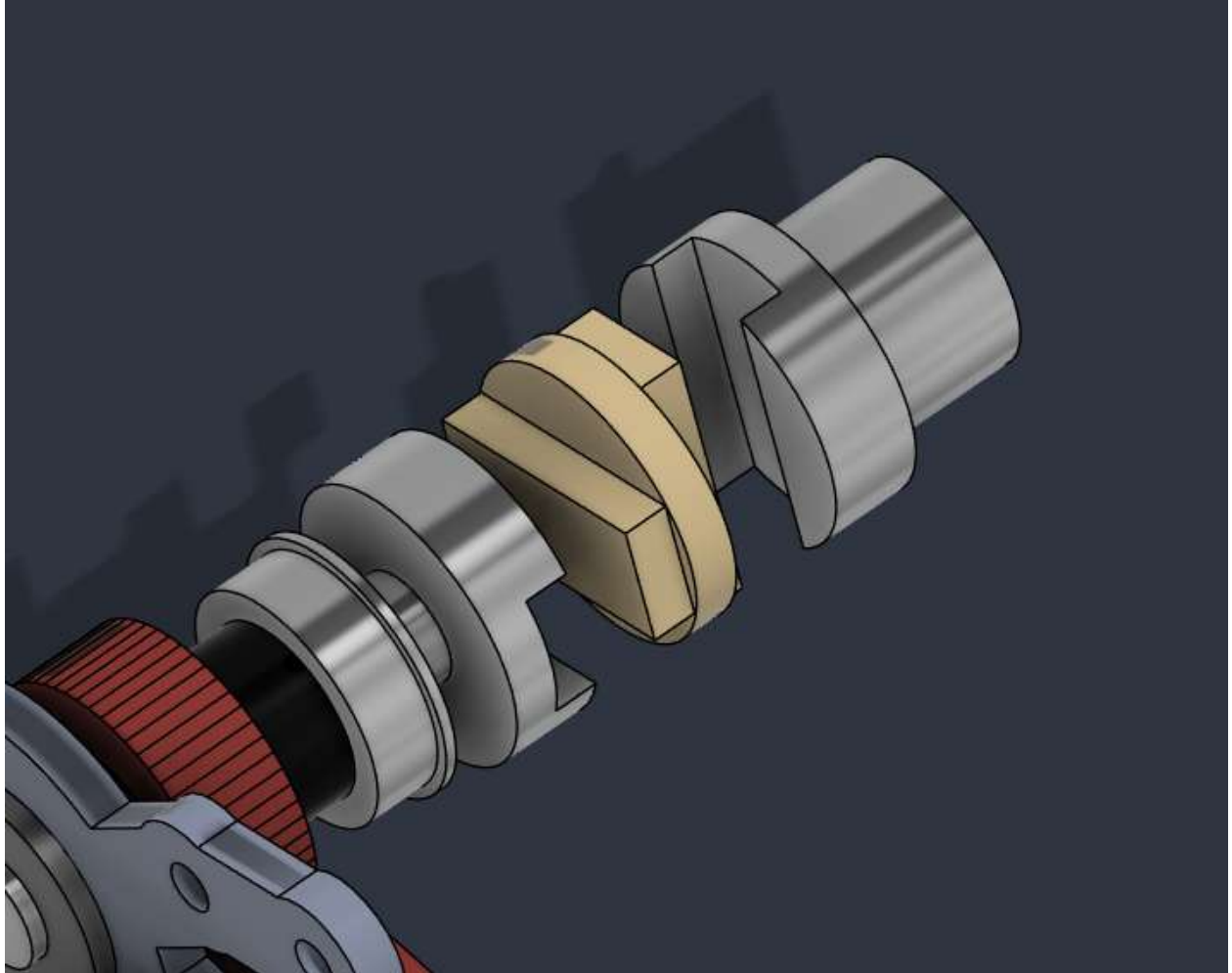
Marcelo Goluboff



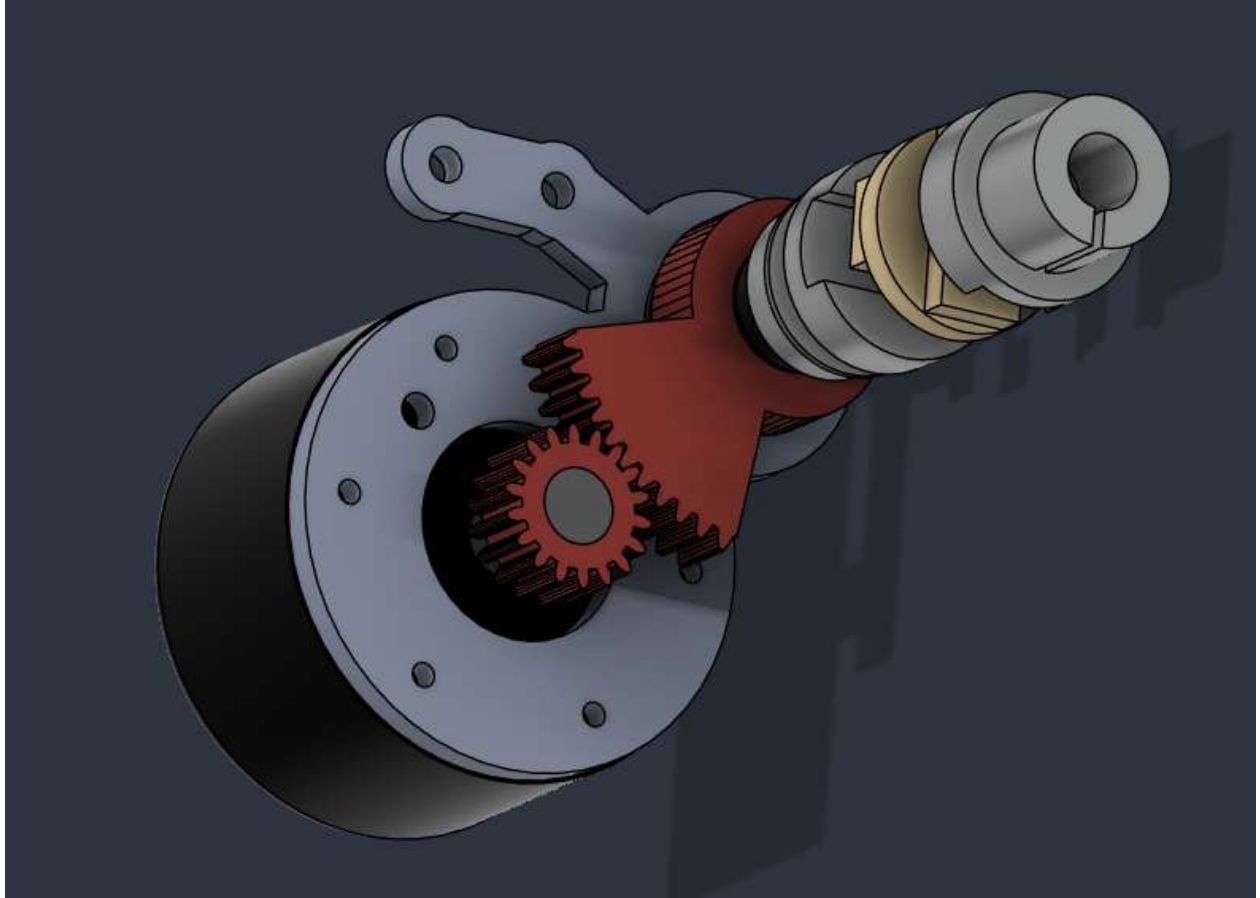
A CAD mockup of the shifting system. It is offset 75mm off of the motor, and when bolted on, only adds about an extra 10mm to the left side of the engine. It does not increase the height of the engine in any way, and it bolts directly to existing threads on the engine (it reuses the water pump mounting holes and is bolted directly above it). No engine modifications are necessary and the entire assembly is bolt-on and can be removed and re-installed with four bolts and a clamping screw for the shift spline.



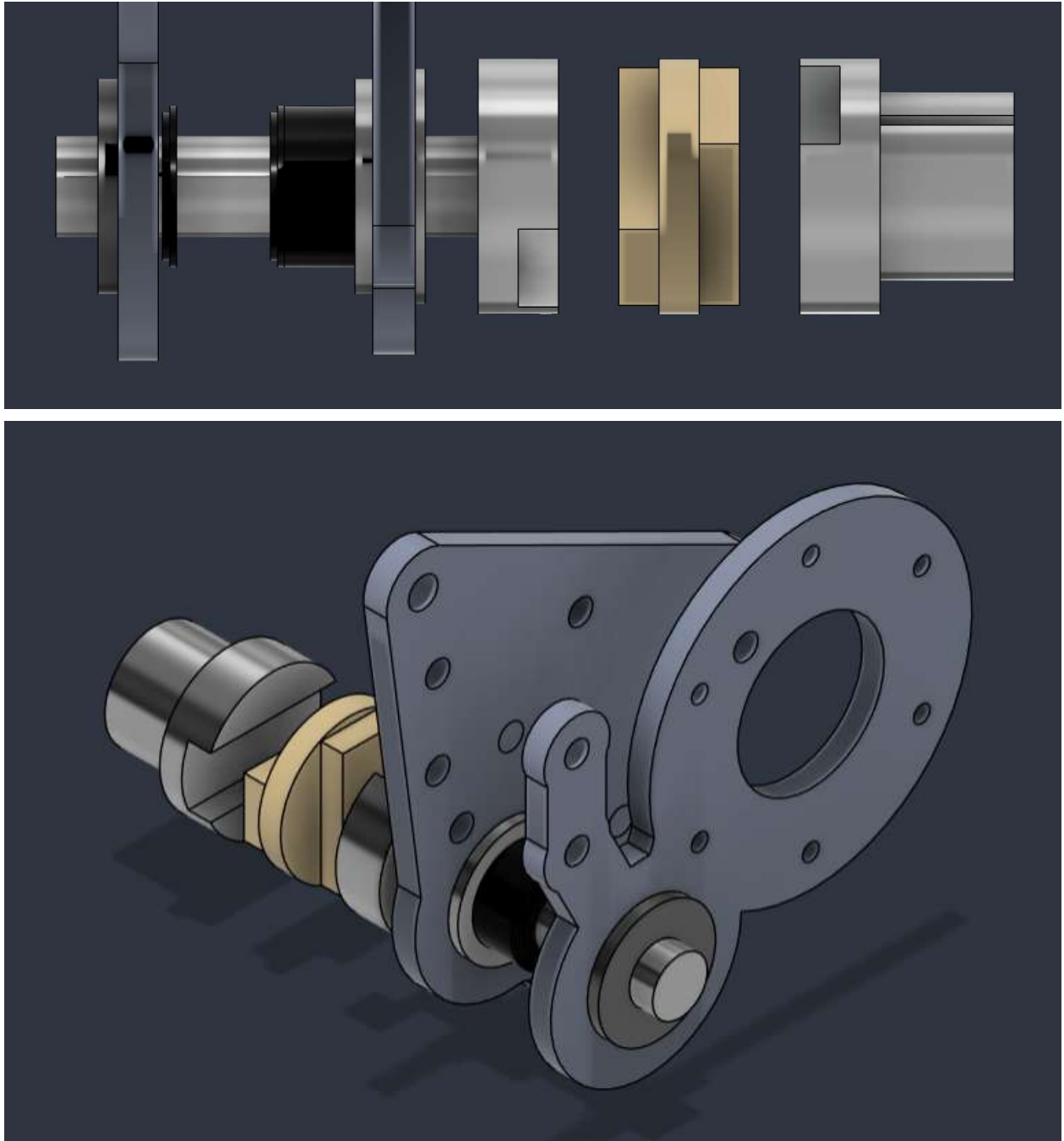
A render of the shift mechanism bolted to a CBR600 motor.



I chose an Oldham coupling for the connection between the engine shift spline and the shaft on the electronic shifter. This makes sure that there's no sideloading on any of the bearings, and any machining/assembly imperfections won't end up in binding or premature bearing failure.



A closer view of the gear mechanism that directly connects the electric motor to the shifter on the engine. A gear ratio of 1:3.33 was chosen and specced in conjunction with an AK70-10 KV100 motor.



In order to keep manufacturing cost and complexity down, the entire assembly is two 1/4 in steel plates cut in one axis, and off-the-shelf components (sourced from McMaster-Carr or otherwise). Flanged bearings were chosen for the driver shaft as they require the least amount of complexity in their seating surfaces.