

AndyMark Replacement Issue: EVO Dog Gear

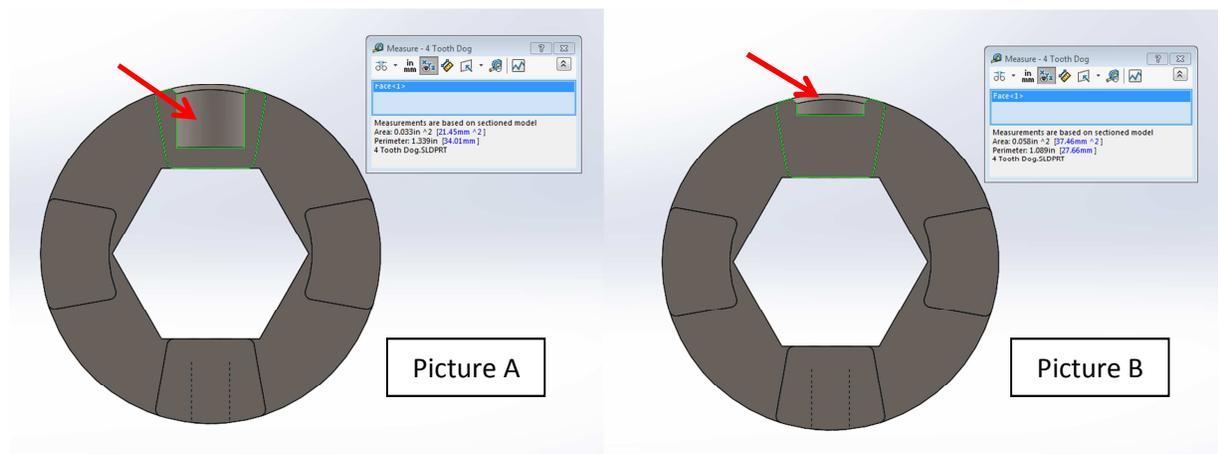
AndyMark is reporting an issue with the EVO Dog Gear (am-3492). The EVO Dog Gears in the field may break under high loads. This past weekend at a pre-ship scrimmage, an FRC team experienced a break and sent us a report. This report cited mistakes in our design. We will act quickly and fix this mistake by sending out new dog gears to all of the early adopters of this product.

Summary and Action:

Our current EVO Dog Gear has a counter bore for the connecting shoulder screw which is too deep. Our reaction is to send out new, replacement EVO Dog Gears (with much shallower counter bores) and longer shoulder screws to all EVO customers. We also will provide a credit of \$25 for each EVO purchase, since this will cause teams time to correct the issue. These replacement EVO Dog Gears and longer shoulder screws will begin to be shipped to each EVO customer by Monday, Feb. 27th.

Issue Details:

The [Current 4-tooth Dog Gear with Deep Counter Bore](#) has a 0.188 deep counter bore for the head of a carbon steel shoulder screw, as shown in Picture A. The shoulder screw is similar to McMaster-Carr part 92012A505, but is made of carbon steel, not stainless steel. The breakage in the field this past weekend was made in the area of the counter bore. We realize this area is a weak point of the dog gear. During our summer 2016 testing, this counter bore was shallower and did not fail. When we chose a production shoulder bolt, we picked one with a taller head than our test version. After choosing this taller head, we erroneously made the counter bore deeper in order for the top of the screw to be flush with the outside of the dog gear. Our solution is to make a new EVO Dog Gear with a very shallow counter bore, as shown in Picture B.



This shallower counter bore allows more material in the cross section of the dog gear, shown in the top portion of Picture B. We are confident this fix provides a robust dog gear for FRC purposes, exceeding the amount of material we tested during our prototype tests.

Here is a drawing of the [New 4-tooth Dog Gear with Shallow Counter Bore \(and more gear volume\)](#).