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FJ Cruiser Front arm Comparison Report. Ref Project v71709. Roadsafe 22/6/2016.
By Donald Silak.

INTRODUCTION

A fabricated replacement design of the FJ Cruiser front Arm along with the original OEM arm have been 3d modelled in Solidworks from 3d scan data for the purpose of comparative testing. These results are only to show that under the same conditions the fabricated arm is stronger than the original Toyota part.

TEST SPEC

The models were both restrained at the pivot point in a totally fixed position. The force applied is 300 kg and acts directly on the internal bore of the ring at the end of the arm as shown. The material was a standard grade steel and was applied to both components. Both load cases were the same.
The models were tested as one solid body welds and gaps were not included.

RESULTS

As can be seen by the attached plots the fabricated arm has less deflection than the OEM arm. The OEM arm bends 2.11mm while the new arm bends only 0.46mm under the same load. Testing for side and down loads both yield similar results and it is fair to say the Roadsafe arm is superior in strength. The 6mm wall thickness of the pipe work is a main contributor to this.

SIDE NOTE

It is to be noted that the original design intent of the OEM part has not been established by this office and this comparison is solely for the determination of the difference in geometry strength. The concentration of stresses and the fatigue factors have not been considered . Also not taken into consideration was the weld geometry and weld material. However it can be assumed the Roadsafe arm will outperform the OEM arm.

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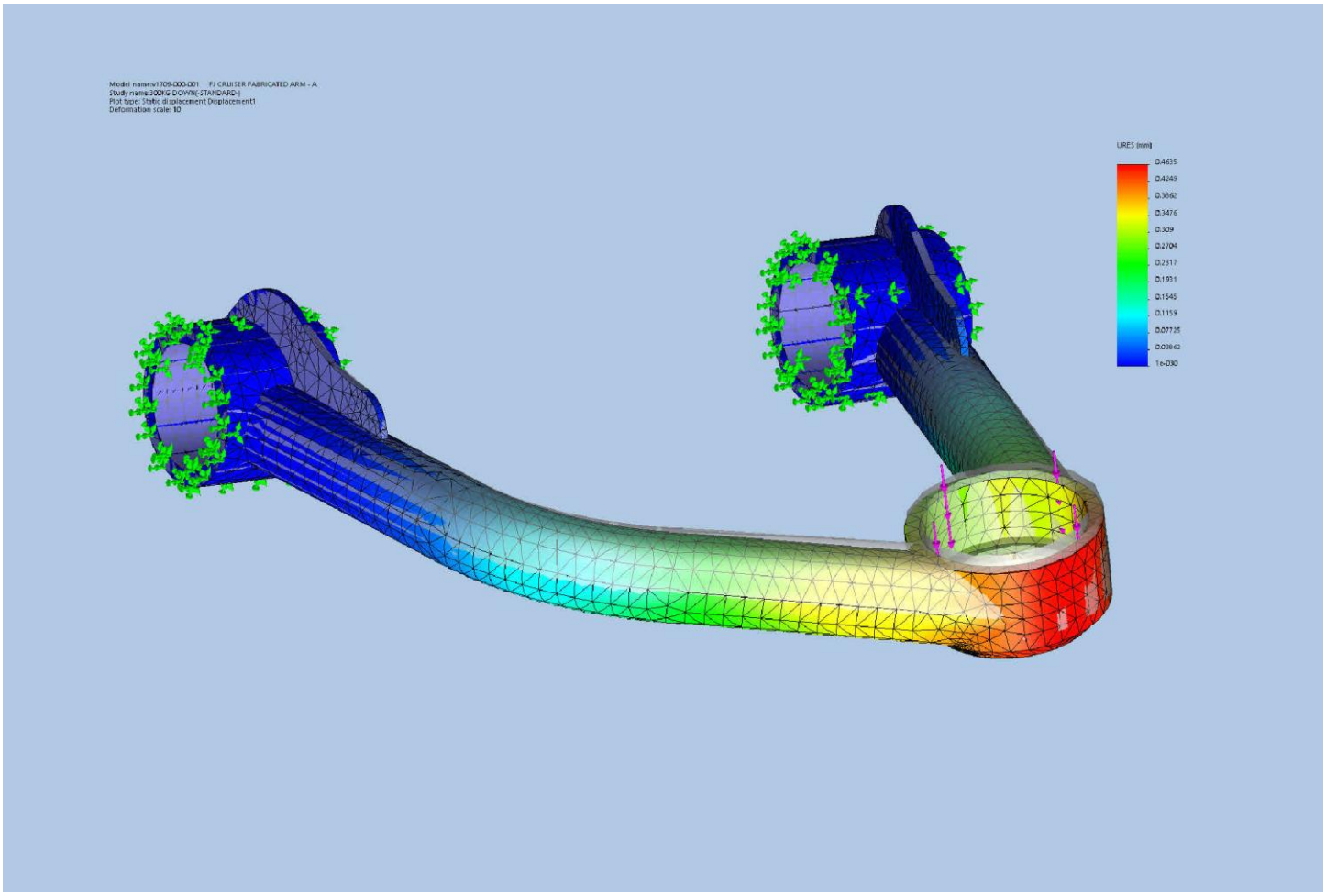

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