ANALYSIS REPORT

M770 Trigger 40 Pound Trigger Pull Stress Analysis

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INTRODUCTION

The purpose of this analysis was to determine the peak stresses in the proposed M770 trigger and compare it to the current trigger. The applied load was a 40 lbf. trigger pull. The linear static evaluation was performed using ANSYS DesignSpace.

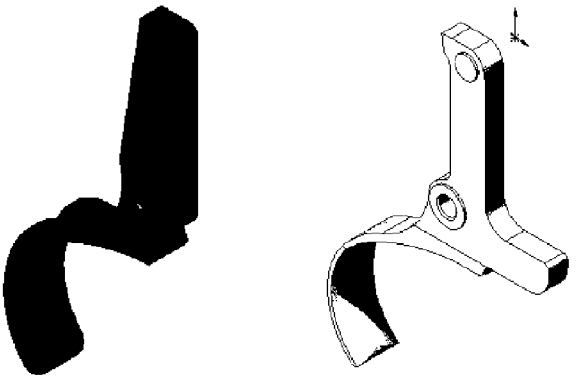

FIGURE 1. 300482 Trigger Blank on left, proposed trigger on right.

RESULTS SUMMARY

The proposed M770 trigger has a slightly higher peak tensile stress on the upper portion of the front of the trigger bow. It has a considerably lower peak compressive stress which occurs at the upper portion of the back of the trigger bow. It also has a considerably higher deflection due to its lack of structural support ribs on the back side of the bow

CONCLUSIONS & RECOMMENDATIONS

Both components will yield if subjected to a 40 lbf. trigger pull. Modifications to the proposed trigger geometry should be considered to bring the peak tensile stress down to the level of the 300482 trigger.

PROCEDURE

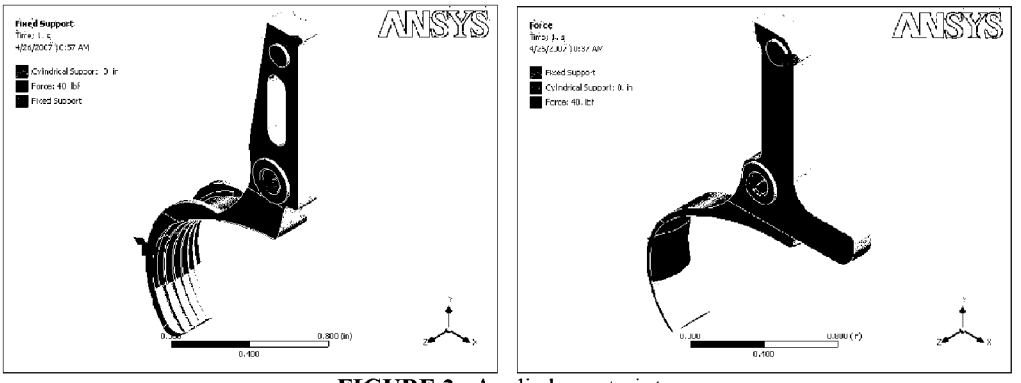

FIGURE 2. Applied constraints.

ANSYS DesignSpace was used to conduct a linear static structural analysis. The triggers shown in **FIGURE 2** were constrained in a similar manner. An edge near the top of both triggers was fixed, constrained to have zero deflections. A cylindrical constraint was applied to the surface comprising the pivot hole allowing rotation about its axis, but allowing zero radial and axial movement. A 40 lbf. load was applied to the areas highlighted in red which was in a zone between 0.675 and 1 inch below the axis of the pivot hole. This force value was chosen due to the SAAMI requirement that a gun not fire when the safety has been set to on and a 40 lbf. load has been applied to the trigger.

Material properties for carburized MPIF MIM-2200 used for this analysis were:

Poissons ratio = 0.3
Elastic Modulus = 2.9e6 psi
Yield Stress of core ~ 70,000 psi
Yield Stress of surface ~ 100,000 psi

DETAILED RESULTS

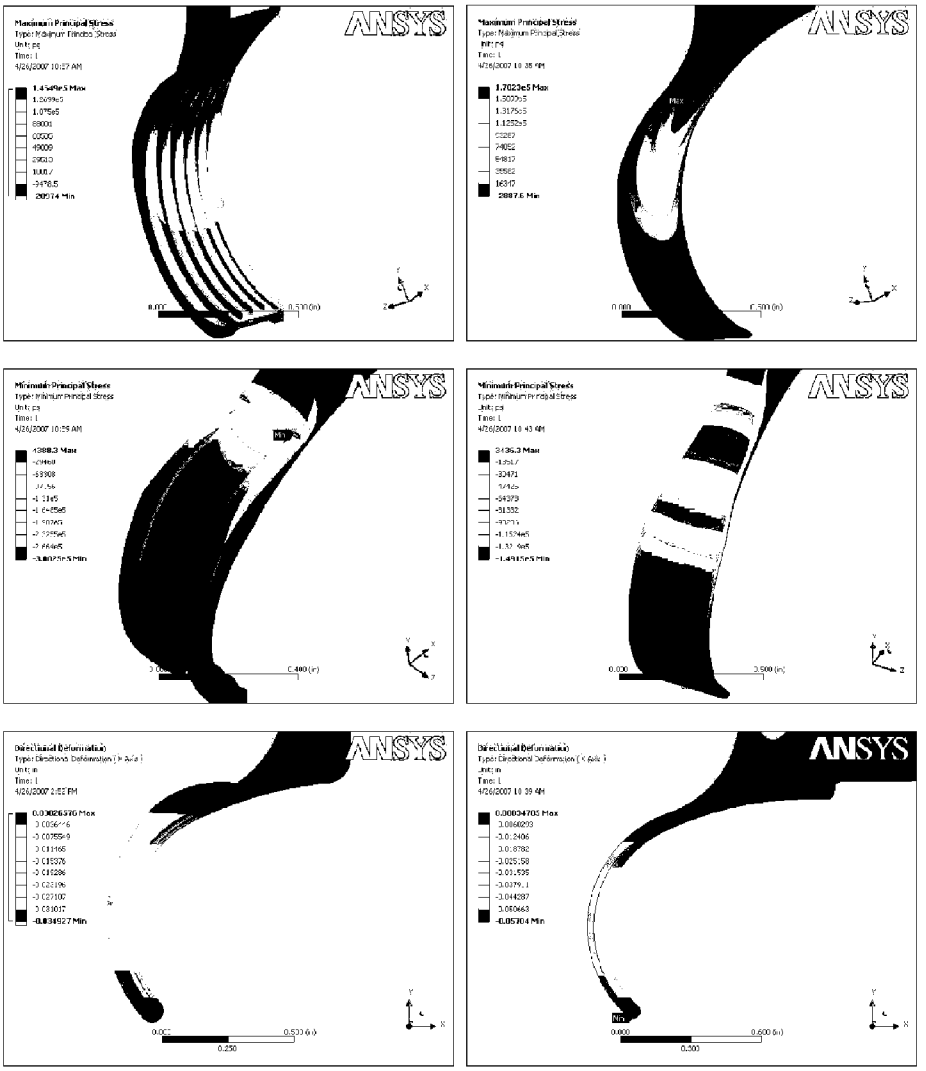

FIGURE 3. Maximum Principal Stress, Minimum Principal Stress, and deflection data.