

Simon Forensic, LLC

Providing material testing and failure analysis for the industrial, transportation, energy, maritime, and manufacturing sectors

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Joinery Construction
10715 Vernon Rd.
Mt Vernon, WA 98258

October 1, 2019

Attn: Jason Peterson

Re: Prototype nut proof loading
Simon Forensic File #3424

Dear Mr. Peterson,

The submitted prototype nuts (3/8"-16) were proof loaded to determine the corresponding grade of nut.

Sample ID:

1. Heat treated 4140
2. Annealed 4140

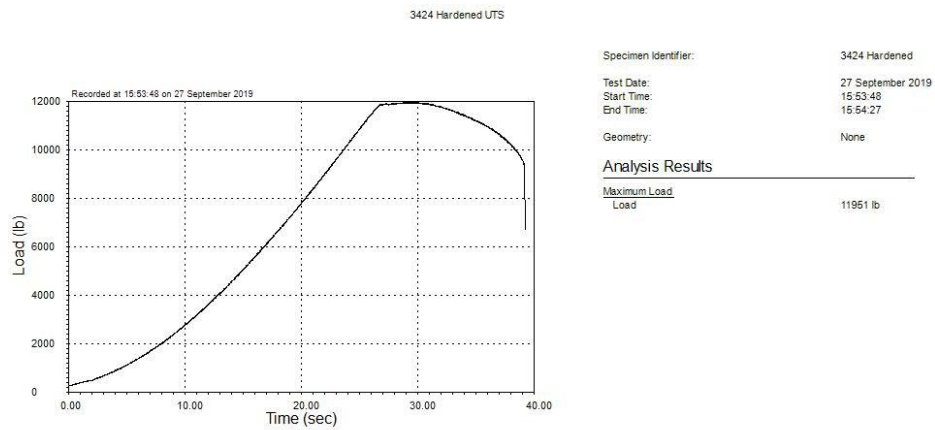
Summary of Findings:

Based upon the analysis to this point the following conclusions are offered.

- Sample 1 was found to meet the proof load tests of both 10,460 lbs. and 11,620 lbs. with no loss of operation. The sample was then loaded to 11,951 lbs. when the 3/8" grade 8 bolt fractured.
- Sample 2 was found to meet the proof load tests of both 10,460 lbs. and 11,620 lbs. with no loss of operation. The sample was then loaded to 12,005 lbs. when the 3/8" grade 8 bolt fractured.

Analysis:

The samples were proof loaded per ASTM A194, initially testing to the grade 2 (corresponding to a grade 5 bolt), and then to the grade 2H (corresponding to a grade 8 bolt). The nuts were tested for performance between each load, then were pulled to failure.



Graph of the ultimate load from the heat treated nut. Note the 3/8" grade 8 bolt fractured with no loss of operational properties of the prototype nut.



Graph of the ultimate load from the nonheat treated nut. Note the 3/8" grade 8 bolt fractured with no loss of operational properties of the prototype nut.

Sincerely,
SIMON FORENSIC, LLC

A handwritten signature in black ink, appearing to read 'Omar Simon', with a stylized flourish at the end.

Omar Simon

Forensic Chemist

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