

## NM4 S/CI Shackle Investigation

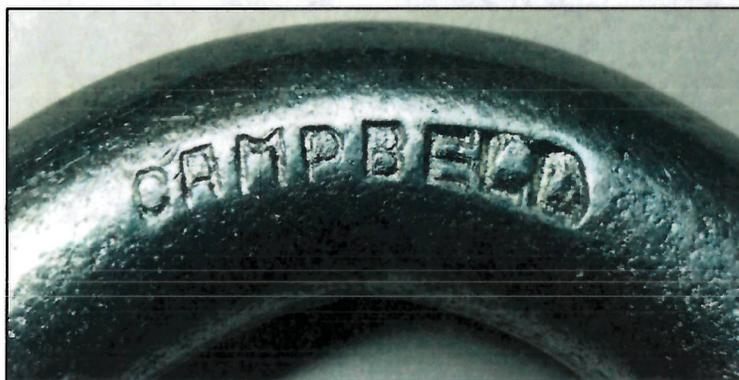
### Summary

On May 29<sup>th</sup>, 2018 a suspicious-looking 3/4" shackle was found at NM4. The part was removed and set aside for investigation. This document contains a list of observations.



### Observations

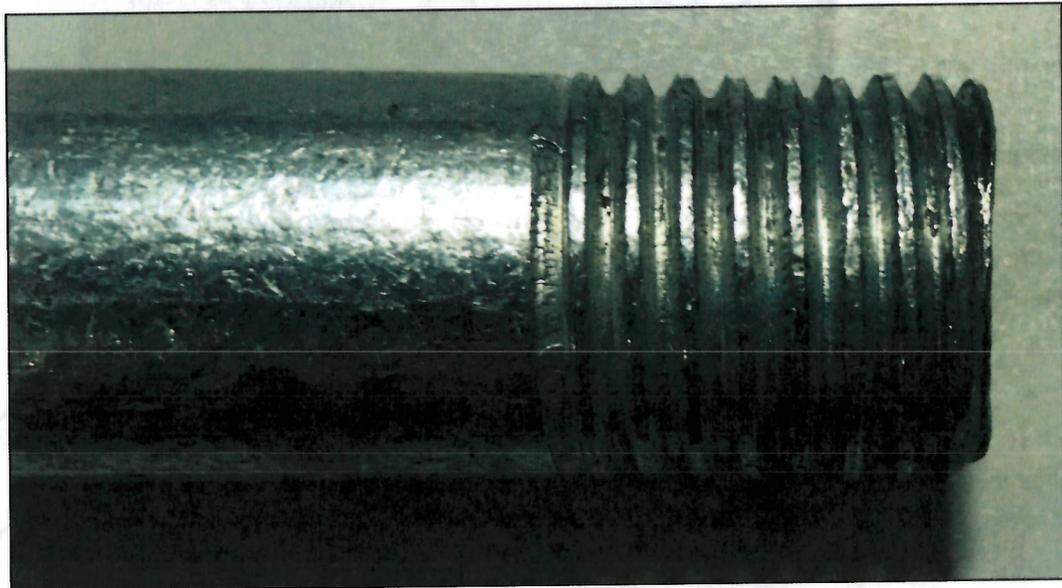
1. Stamping – The depth and size of the stamped characters on this shackle is inconsistent. Additionally, the overall quality and legibility is poor. The lettering, style and orientation of shackles in Campbell's catalogue is vastly different.



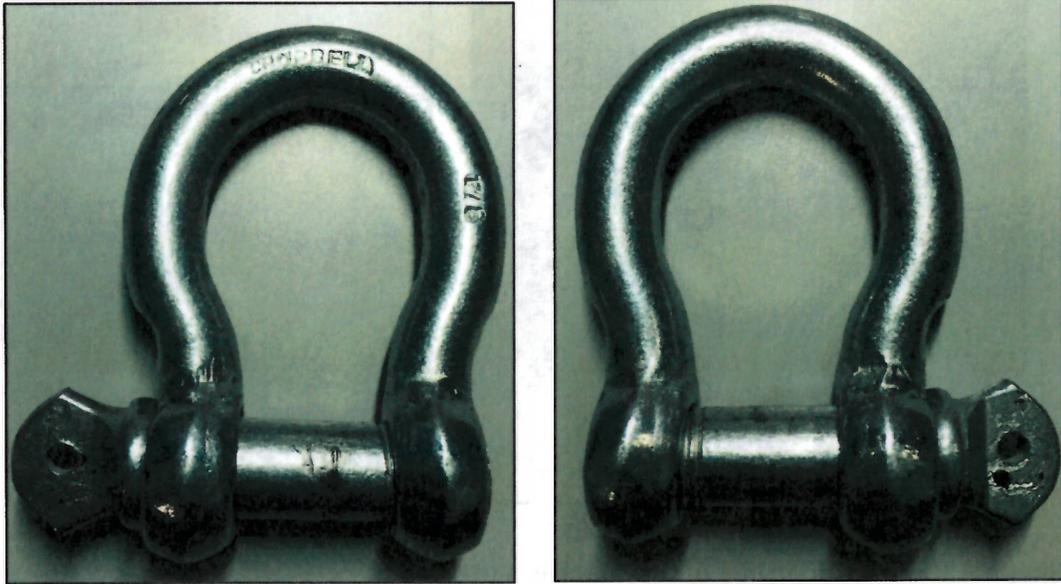
2. Surface Coating – The surface finish on the part is a metallic plating (probably zinc). Campbell's catalogue only lists shackles that are painted or galvanized.



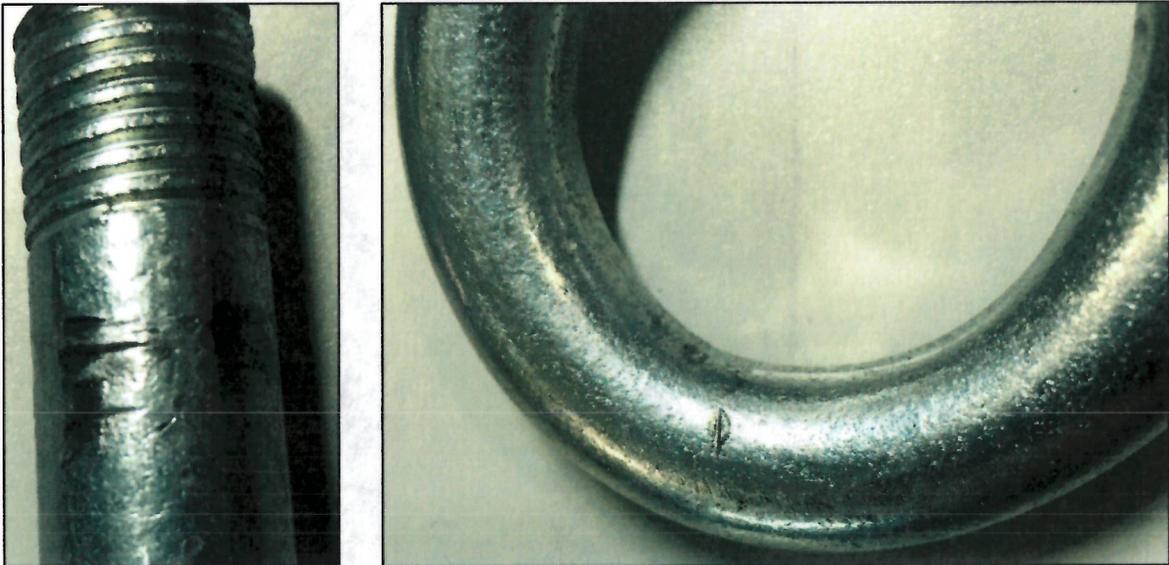
3. Pin Threads – The thread profile used on this shackle and pin does not conform to the ANSI/ASME B1.1 - UNC thread dimensions.



4. No Capacity Rating – In order to conform to ASME B30.26 - Rigging Hardware, new shackles are must have a load capacity forged, cast or die stamped to the shackle body. Campbell's catalogue states that their products have load ratings. The part found in NM4 does not.



5. Denting – The pin and shackle body both have large indentations. This is not typical behavior for hardened steel and is considered *Removal Criteria* by ASME B30.26.



6. Defects – The pin through hole and internal threads show evidence of loose tolerances, voids/porosity and poor manufacturing control.



7. Shape – The overall profile of the shackle is irregular.



### Conclusion

It is likely that this part is a counterfeit. This part should not be in use.

# China Shackle



# Unmarked Shackles



# Turnbuckle



# Turnbuckles In Use



