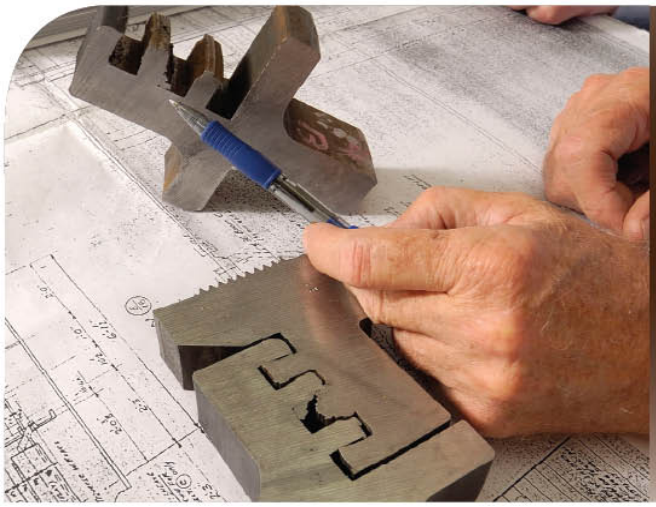


Asset Care Counts

EDITION 6 - Defence Applications **May 2011**

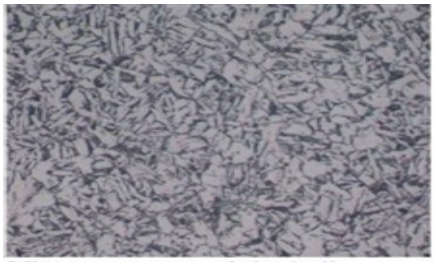
Computer Modeling Work in Conjunction with Metallurgical Investigations and Mechanical Testing

Metallurgical Evaluation & Computer Modeling

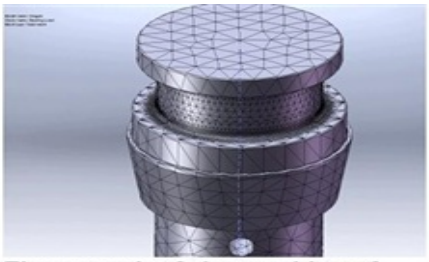
Kingpins used for mechanical coupling of articulated vehicles, particularly the prime movers and trailers, are subjected to design certification to the highest standard of safety for military applications.

The suitability of the kingpin was assessed by metallurgical, mechanical testing and finite element analysis (FEA) in a steady state condition. Results obtained from a number of metallurgical and mechanical tests were used to further validate and assess the suitability of the kingpin. A 3D computer model of the kingpin was created using SolidWorks representing the mechanical features that have extreme importance in stress analysis in various loading conditions.

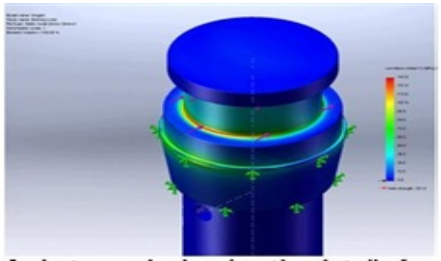
Meshing of the main journal of the pin was done by employing a large number of elements in areas of critical fillet radii. The maximum von Mises stress was then determined at those critical areas at various loading conditions in order to assess the suitability of the pin and it's compliance with the required specifications. Interdisciplinary work that involves powerful computer modeling coupled with high level metallurgical analysis and mechanical testing showcases the broad technical capabilities of ALS Industrial.



Microstructure of the bulk material of the component



Photograph of the meshing of the main journal



A photograph showing the detail of von Mises stress distribution in critical fillet radii

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