

Summary

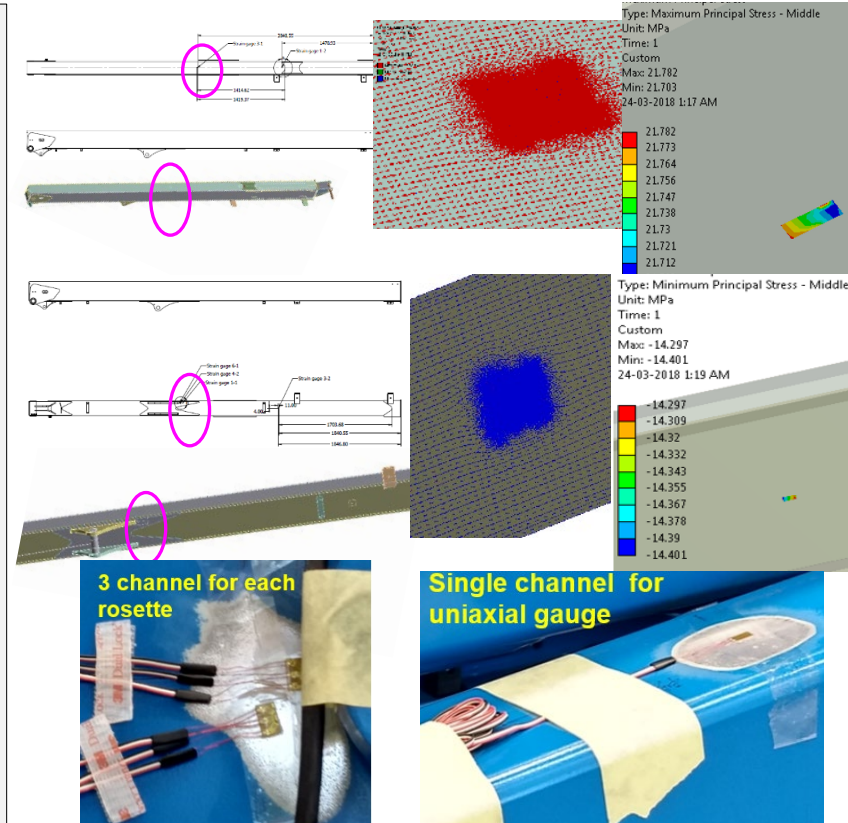
Project Name: : Finite Element Analysis correlation wrt. Strain gauge testing

Software: ANSYS Workbench,

Scope: Assembly/sub assembly level Finite Element Analysis with friction contact methodology to achieve better correlation with physical strain gauge testing



- Strain gauges are generated in Finite Element model with required uniaxial and rosette vectors.
- Gauge zero setting and loading positions are identified to carry out static analysis and physical testing reference.
- Test loads are applied in kinematic model to extract all the pin reactions, lift cylinder forces
- Static analysis with friction contact method is used to solve with necessary input forces extracted from kinematic model.
- Participated in testing activity to mount the gauges and capture the strain values



FEA to physical testing correlation achieved in the range of 75% at weld zones and 85% at away from weld zones.

Summary

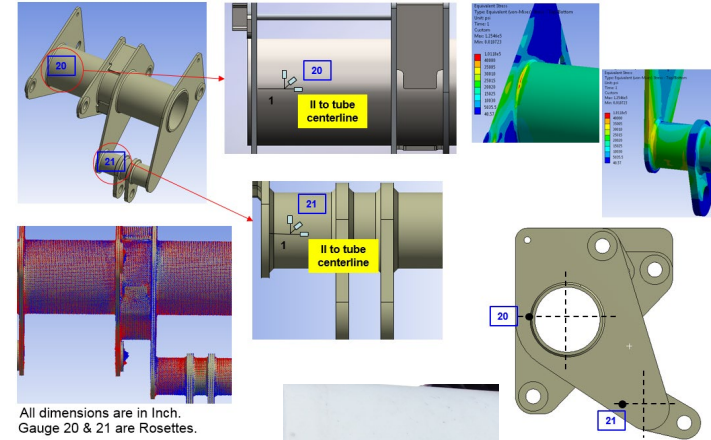
Project Name: Finite Element Analysis vs Strain Gauge correlation of Utility Boom System

Software: ANSYS Workbench

Scope: System level Finite Element Analysis with frictional contact methodology to achieve correlation with physical strain gauge testing



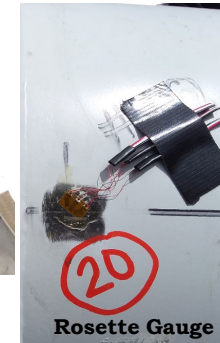
- Strain gauge locations along with strain values were identified in Finite Element model with required uniaxial and rosette vectors.
- Loading positions are identified to carry out static analysis and physical testing.
- Hand calculations were performed to determine all the pin reactions, cylinder forces.
- Slew Bearing model with all bolts in FEA at their respective locations to simulate the effect of bearing & to account the bolt preloads.
- Static analysis was carried out with friction contact method and evaluated of all forces with respect to hand calculations.
- Participated in strain gauge activity to mount the gauges and capture the strain values.



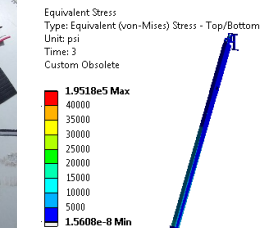
All dimensions are in Inch.
Gauge 20 & 21 are Rosettes.



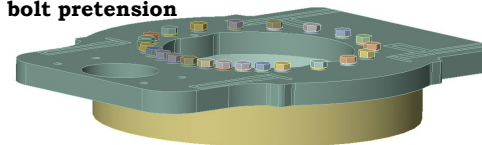
Uniaxial Gauge



Rosette Gauge



Slew bearing with bolt pretension



FEA to strain gauge correlation achieved with minimum of 85% at all locations.