
Case Study - Materials Testing

Fatigue Testing - Automotive

A Tier 2 supplier of automotive stampings discovered a problem with a steel stamping which they were producing for an OEM. A flaw had developed in the deep drawn steel part which had not been captured by the existing quality system and the parts had made it into production vehicles. Since the part was an important structural component they approached us to help them determine the fatigue life of the defective parts and the effectiveness of a remediation strategy.

We reviewed the supplied information and provided the client with a testing proposal. The proposal included a design concept of a fixture to restrain the component in a servo-hydraulic test machine and load it with typical and worst case conditions. We also recommended methods to measure the stress at key locations and proposed a method to confirm the evidence of cracks.

Design and fabrication of the fixturing was completed over a weekend with fatigue testing on our Instron servo-hydraulic machine starting before Monday morning. Strain gages and a multi-channel data acquisition system were used to measure the stresses on the component and non-destructive method (LPI) was used to locate and confirm the presence of cracking. Testing continued on a series of components to verify the fatigue life of a series of configurations.

Testing confirmed that the defect was not an immediate structural concern and we went on to prove-out the clients remediation strategy.

Areas of Expertise: CAD modeling
Strain gaging and data acquisition
Fixture design and fabrication
Fatigue testing
Liquid penetrant testing

Equipment Used: Solidworks CAD modeling software
Manual and CNC machine tools
Instron servo-hydraulic testing machine
LabView data acquisition system