

Industrial Research Project Title	Quality Improvement of Cross Member Assembly Process in the Automotive Parts Industry
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Abstract

Quality improvement of the cross member assembly process for the automotive parts industry is addressed in this study. The major problems of the assembly are identified and analyzed. The bend of the cross member is then selected as the topic for quality improvement. This research project focuses on improvement of the cross member involving welding methods and seeks to reduce the amount of bend in the cross member.

The current cross member assembly process is analyzed for the amount of bending and the process performance capability. Then, employing cause and effect diagrams, and failure mode and effect analysis (FMEA), accompanied by in-depth study of the resultant data, the causes of cross member bend can be found. The possible factors of the bending are welding sequence, number of welds, welding voltage, and wire speed. These factors are controlled, and hypothesis tests by inference are conducted to obtain for a difference in mean of two normal distributions. The significant factors of cross member bend improvement are presented. By changing the welding sequence and the number of welds the new welding method, yields $C_{pk} = 0.03$ defect ratio 54 percent. Before improvement $C_{pk} = -0.09$ defect ratio 98 percent. After the new welding method the defect ratio is reduced 44 percent.