

Quality Improvement in Crank Shaft Manufacturing Cell through Six Sigma Approach



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Abstract:

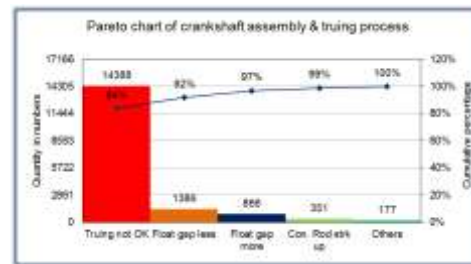
Global competition demands a continuous need for manufacturers to deliver best in class quality at low cost with on time delivery. Companies focus on improving product quality by reduction of process variability and non-conformance to sustain a competitive edge. Six sigma is a systematic problem solving strategy applied for reducing variations in the process by extensively applying statistical tools.

To increase overall customer satisfaction and to build brand image in a two wheeler, it is necessary to improve engine performance. Quality improvements were carried out in the critical engine part of crankshaft assembly by applying six sigma approach. Critical to Quality parameters were identified. Gauge R&R studied for CTQs and arrived present sigma level of the CTQs. Analysis carried out using cause and effect matrix, multivariate analysis and Design of Experiments. The existing tolerances of the part and fixture were examined by applying GD&T stack up tolerance analysis. Solutions were arrived by benchmarking and brainstorming, corrective action kaizens were initiated to reduce the variation in the process. Standardised the actions by updating necessary documents.

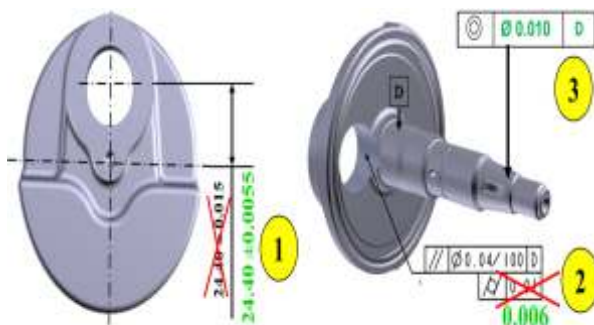
The main objective of the project is to improve first pass yield of the crankshaft. It has improved from 40 to 65 percentages. Intangible benefits like process scrap cost, rework cost reduction is expected by 50 lakhs per annum. The improvements were achieved by addressing the variations in the process. The new proposals are suggested for further improvement.



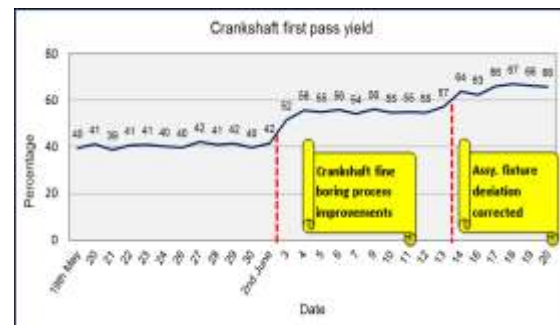
Crankshaft first pass yield trend



Pareto chart of crankshaft assembly rework



Recommended tolerance changes in the crankshaft



Crankshaft first pass yield Before Vs After project