The Objective: The customer wanted us to build an assembly line to assembly 10,00,000 radiator motors in a year with 26 operators.

The Challenges: The challenges in the project were variety of engineering complexities in the assembly process. Controlling dimensions of the pressed rivet end was very critical for the quality of the assembly. There were complex material deformations during sealing operation.

The Solution: The assembly line consisted of 21 stations along with inspection gauges and poke - yoke systems. Inline measurement of critical parameters in the assembly stations ensured high quality of assemblies at every stage.

The assembly line was built using our 'Consult-Design-Build' delivery model. The assembly line consisted of the armature, end bracket, case assembly and motor sub assembly stations. The assembled armatures were tested for Hi- Pot, surge, resistance, and winding 'Direction of Rotation'. These tests were conducted on a single bench leading to significant reduction in testing time. The testing stations used pneumatic pins for making fine electrical contacts.

In the assembly of the end bracket, 4 rivets needed to be punched simultaneously and the rivet punching parameters were unknown. For this, we internally developed complete assembly parameters to achieve the assembly dimensional requirements. The parameters included critical punch die designs, assembly forces, and critical alignment of all 4 rivets. The end brackets assembly was tested for resistance using micro-ohm meters.

The case assembly consisted of a critical bearing caulking operation, where the caulking involved small material flow around the punches which led to high ejection force requirement. Motor assembly was performed using a multistage material deformation process. End of line test bench was provided to perform no load, load, and Hi - Pot test along with a date coding system to print date code if all the tests were successful passed.