

DEVELOPING A CUSTOMIZED TOOLING SOLUTION TO MEET THE UNIQUE NEEDS OF AN AUTOMOTIVE CUSTOMER

ATD Helped a Prominent Player in the Automotive Industry Cut Costs and Increase Efficiency With Metal-Stamped Part Design

When an international manufacturer in the automotive industry approached Automation Tool & Die with a specific need — a uniquely designed metal stamped part that was complex in its make and function — ATD not only designed an improved part, it also significantly reduced the company's cost and boosted its production efficiency.



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THE CUSTOMER

The customer, a prominent player in the automotive industry, turned to ATD about four years ago when the project in question was not working well with its previous vendor. The end user of the part — an aluminum heat shield that surrounded an oil pan to protect the hoses and lines from getting overheated — was Ford Motor Co.

The parts from the customer's previous vendor had a 40 percent failure rate, resulting in higher costs, slower production and general inefficiency. Having heard about ATD's expertise in customized tooling, the customer reached out for help.

THE CHALLENGE

While the central challenge was the looming concern about the part's potential failure, there were other issues that also needed to be resolved during the process.

Failure in the form of thinning or cracking would have significant implications for the customer's operations, potentially causing costly production delays or quality issues. The customer became responsible for those failed parts: their production cost, the cost applied to sort the cracked product from the good product and the cost of disposal for material of those parts. In addition, the customer would have to expedite the next order so that Ford would not fall behind.

"For this particular project, there was an existing tool from another metal stamper," said Bill Bennett, ATD President and CEO. "The tool was failing, so the vendor thought the solution was to add a large amount of lubrication. So on top of the 40 percent

failure rate, the parts were heavily oiled — to the point where they had to add an external process for cleaning."

This added costs for handling and transportation, as well as the cleaning cycle, simply to remove the excess lubricant — but the vendor never solved the root cause of the failure.

Furthermore, there were challenges in clearly communicating the differences between the required part and seemingly similar ones. If the client were to opt for a design that merely looked like other parts without considering the unique requirements of the new part, it could also lead to a failed component. This scenario added a level of urgency and high stakes to the decision-making process, underscoring the need for a precisely customized solution.

"Communication can be difficult at times, but it's important to understand what the customer needs, and how open they are when it comes to accepting our suggestions," said Dan Carter, ATD Quality Manager. "Sometimes a customer knows our expertise and lets us take the lead; other times customers are more proud of their designs, so we must be delicate with data-driven information."

He said that ATD often uses simulation data and physical samples to aid communication needs. ATD provides prototype tooling at its expense in order to show parts before and after its suggested improvements.



THE SOLUTION

In response to these challenges, ATD developed a customized tooling solution using advanced CAD software, reverse engineering and other innovative capabilities.

“We had no die drawing; all we had were parts,” Bennett said. “Knowing our expertise and the fact that we were going to run this in a servo press, we felt we could overcome the thinning and cracking and significantly reduce the failure rate.”

ATD assessed the tool and made adjustments to soften some radiuses and allow the material to flow a little better so it was no longer being stretched, which caused it to crack or rip in certain areas.

“Aluminum, just like stainless steel or carbon material, can vary from one lot to another when it comes to chemistry and mechanicals,” said Carter. “We focused on building a tool where it wouldn’t matter how the chemistries came in from batch to batch; it automatically compensates for issues with the materials and parts.”

Using the latest CAD software, ATD was able to enter data to adjust variables, including material type and thickness, the CAD model of the part and the dissections that would be formed when cutting the material. The software shows a color mapping where there are hotspots — which is where there will be thinning or cracking issues.

“We show the ‘before’ and then we use the simulation to make adjustments to the tool that allows the material to flow better,” Carter said. “Now the simulation shows better results — no hotspots — for a much better part. So we know what areas to address, first by making those adjustments in the simulation, then to the tool and then doing trial runs.”

The customer also wanted to eliminate the wash process, since they were spending between 20 and 25 cents per part to cover that extra step. ATD has experience working with different types of lubricants, specifically for aluminum, so it chose one that would be dry to the touch with 24 hours of air movement.

“To demonstrate the effectiveness to the customer, we made a video,” said Bennett.

“We took the bad parts, dipped them in this lubricant to saturate them, and put them in a wire rack under a ceiling fan. The next morning, the parts were completely dry. We overnighted them to our customer and they couldn’t believe it.”

In order to overcome the secondary challenge of communication, ATD developed a solution that would work and then presented that solution, giving input on what can and cannot be done, with a couple of options for each challenge. When the customer still had some skepticism, ATD provided simulation data and physical samples.

“We went through strip analysis as a team, laid out a plan, and used ATD’s reverse engineering capabilities,” Bennett said.

“We implemented changes and proved them out without adding any hard coating to the tool seals. We did a run of 500 pieces, performed the proven lube process — thereby eliminating the washing step — and worked with coating experts to match a coating for the raw material. The whole process took about seven weeks.”



THE RESULTS

When the process was complete, the customer's quality department praised ATD for its solution, which completely eliminated the part's failure rate. In fact, ATD's report card from the customer has shown zero defects for the part for almost four years now. The customer realized substantial cost savings, improved tooling design and increased confidence in the part's performance.

In addition to cutting costs by eliminating the wash step, the customer realized significant cost savings by no longer having to purchase failed parts.

"The customer's previous vendor pushed the loss onto the customer, so they had to buy all the parts, no matter what," Bennett said. "The vendor sorted the good parts from bad, but for over a year the client was buying all the parts at a 40 percent scrap rate."

Realizing that ATD is an innovative problem solver, the successful project resulted in the customer's loyalty. Since then, ATD has worked with the client on several projects, growing the relationship from a brand-new account to a seven-figure client.

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