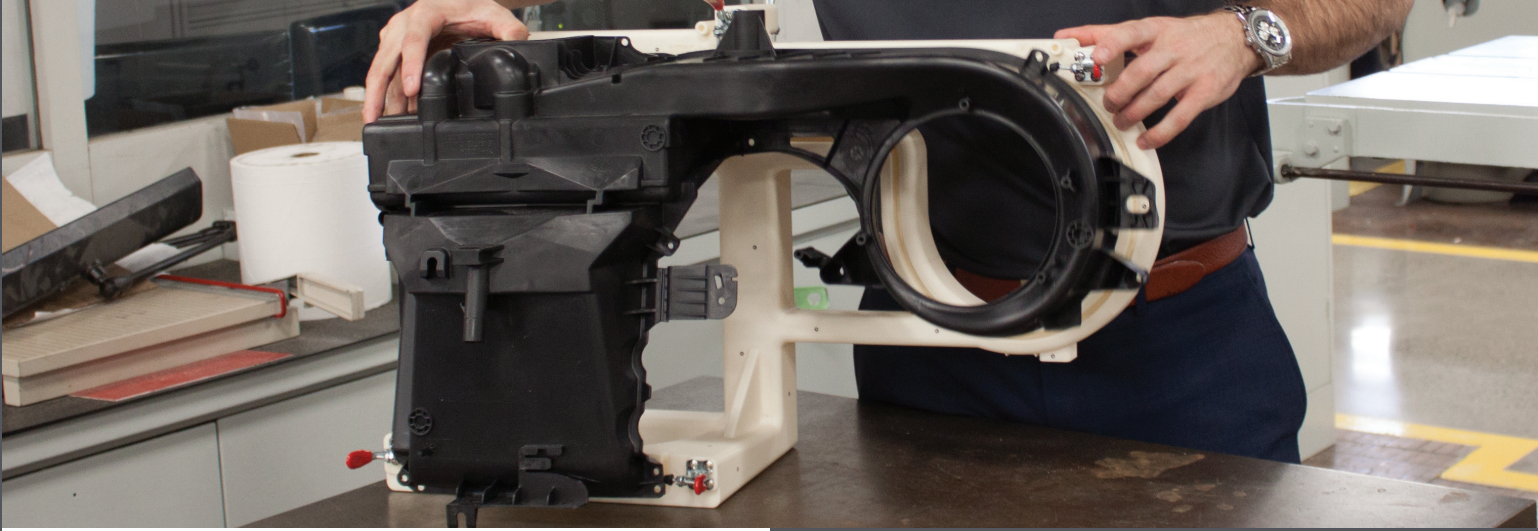


# 0 to 60: 3D printing puts fixtures into gear

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DIRECT MANUFACTURING





## MAHLE Finds value with 3D printing

3D printed cars, airplane components and medical devices get the lion's share of industry headlines. But global manufacturers like MAHLE, a leading automotive parts supplier, have found the technology offers tremendous value beyond those on the front page.

For one of its latest developments, MAHLE was searching for a faster and less expensive way to make fixtures for automotive HVAC assemblies. The fixture was to validate MAHLE's production part, ensuring they could move onto the next phase of manufacturing without skipping a beat – and save time and money in the process.

“

We worked with Stratasys Direct Manufacturing because while we're proponents of 3D printing, we didn't have their level of expertise, technology or capacity to complete this project in-house.”

Jim Andersen  
Senior Project Engineer, MAHLE

# The Challenge manufacturing a unique fixture-fast

**MAHLE needed a fixture, and they need it fast.**

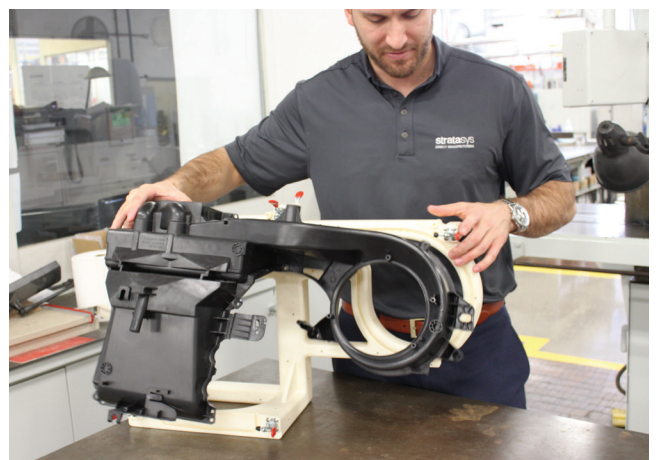
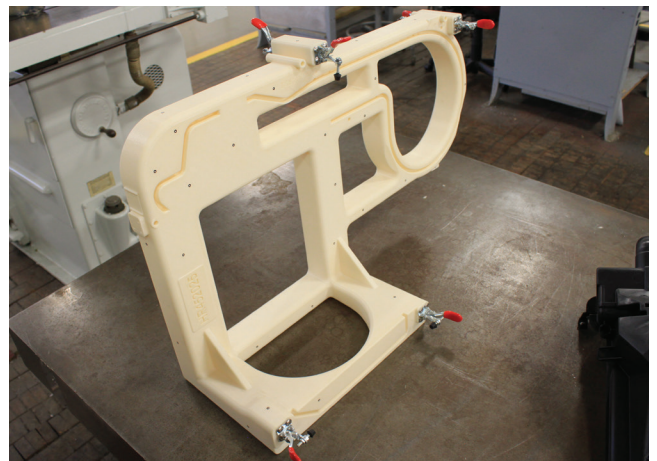
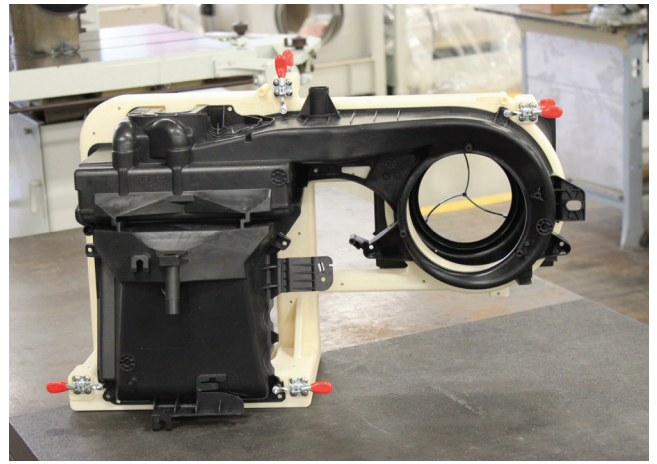
The fixture had to be designed, built and shipped from the United States to South Korea within a week. Without a fixture to verify the part's design, accuracy and stability, MAHLE's production timeline could be compromised. Given that timeline, along with their internal 3D printing knowledge and technology gaps, MAHLE needed a service provider with high degrees of flexibility, capacity and technical knowledge to get the job done.

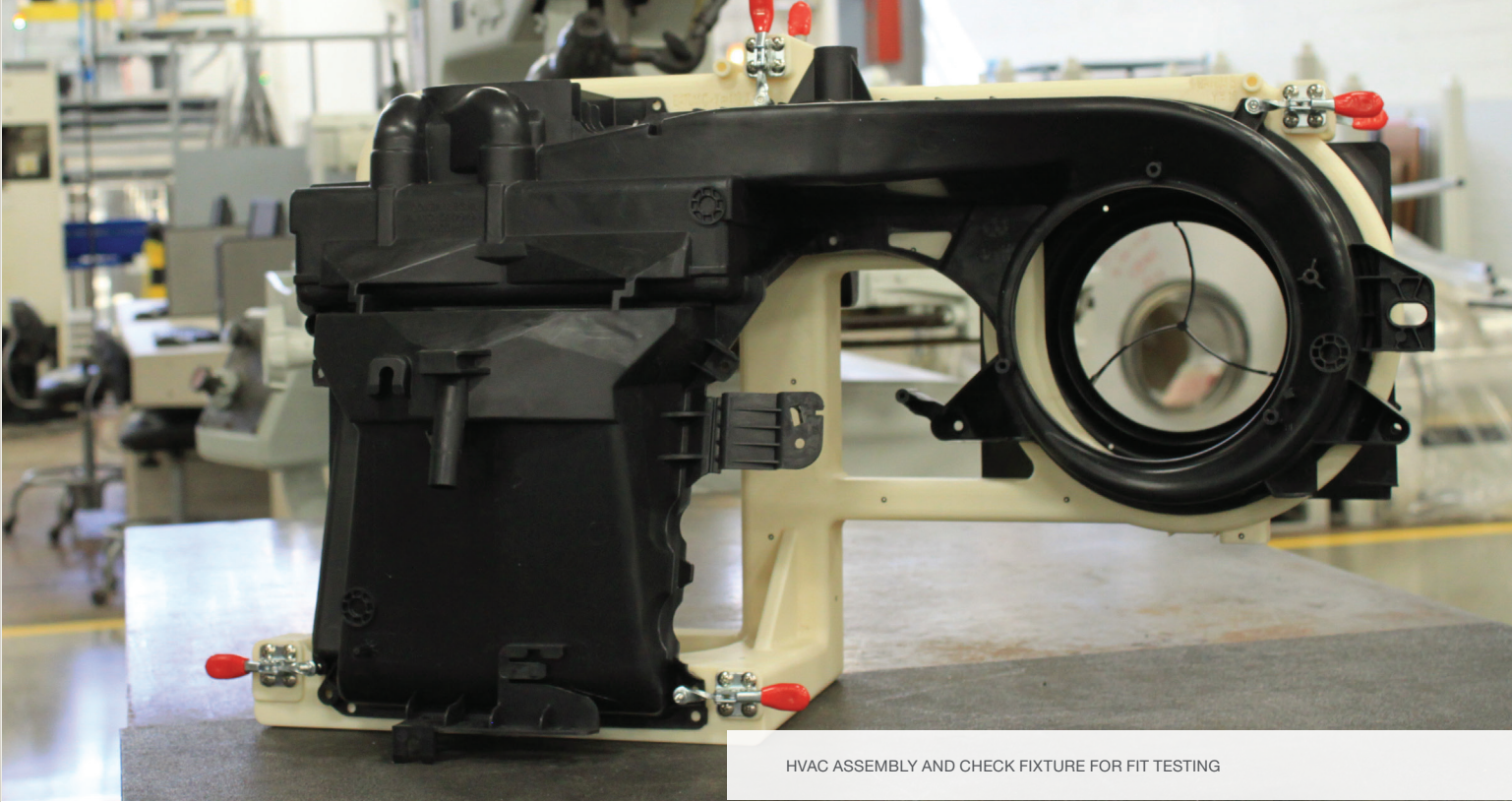
"Initially, we weren't sure this could be finished in time because of the tight turnaround," said Joe Czach, prototype shop manager at MAHLE.

The immediate need meant a steel machined fixture wasn't an option. Plus, there were other requirements that had to be met, beyond the compressed timeline.

The team wanted to consolidate the fixture from three separate components into one part, which would present another hurdle for traditional manufacturing methods. A robust, inexpensive part that had tight dimensional accuracy and solid stability was vital.

Based on the part's parameters, MAHLE knew 3D printing could make the fixture a reality. The company also understood the benefits of 3D printing its part, including reduced lead times, lower costs and increased productivity. But to make their complex fixture a reality, MAHLE had to look outside its company walls for additional expertise and equipment.





HVAC ASSEMBLY AND CHECK FIXTURE FOR FIT TESTING

## The Solution collaborate with design services

To bridge the knowledge and equipment gaps MAHLE turned to Stratasys Direct Manufacturing, which provided consultation from design through production. The company's ability to quickly and accurately build the fixture, in-depth understanding of 3D printing, and prior work with MAHLE made Stratasys Direct Manufacturing a natural fit for the job.

"We worked with Stratasys Direct Manufacturing because while we're proponents of 3D printing, we didn't have their level of expertise, technology or capacity to complete this project in-house," said Jim Anderson, senior project engineer at MAHLE. "Working with them on a project like this exposes us to new ways of thinking and helps us apply the technology to areas we haven't yet."

For starters, Stratasys Direct Manufacturing's Design Services group worked with MAHLE to redesign the part to achieve the desired results. That meant designing for additive

manufacturability. Unlike traditional manufacturing, which requires engineers and designers to adhere to strict assembly rules and to design parts based on their production method, additive manufacturing allows for parts to be designed for their form, fit and function. It also frees users from the design constraints of traditional manufacturing, paving the way for a consolidated part that would retain its shape over time.

To create a robust and accurate fixture, Stratasys Direct Manufacturing used FDM® Technology, a process that builds durable and dimensionally stable parts. For a material, Professional Services recommended ASA, one the MAHLE team hadn't considered using initially. The production-grade thermoplastic combines mechanical strength and UV stability with the best aesthetics FDM offers. ASA is also lighter than steel, making it more ergonomic, and demonstrated more than enough durability to perform as required.

# The Results

## speed, quality & in-house knowledge

Using 3D printing to build its fixture meant MAHLE reaped many benefits. In less than a week, MAHLE had a redesigned, dimensionally accurate and stable part delivered to them from across the world – a process that would have taken 4 to 5 weeks with conventional manufacturing. Thanks to part consolidation, the fixture had a continuous and smooth mating interface, which could only be replicated in a metal fixture at a considerable cost. MAHLE saved thousands by using 3D printing instead of CNC machining.

“This project demonstrates the tremendous manufacturing and business value 3D printing offers projects of all shapes and sizes – not just the ones grabbing headlines,” said Matt Stenoien, business development manager at Stratasys Direct Manufacturing. “Companies like MAHLE who are eager to learn and further implement 3D printing into their manufacturing process are giving themselves a competitive advantage.”

The fixture’s success could serve as a launching point for increased use of 3D printing: MAHLE hopes to find a number of applications where it is the go-to method for making jigs and fixtures.

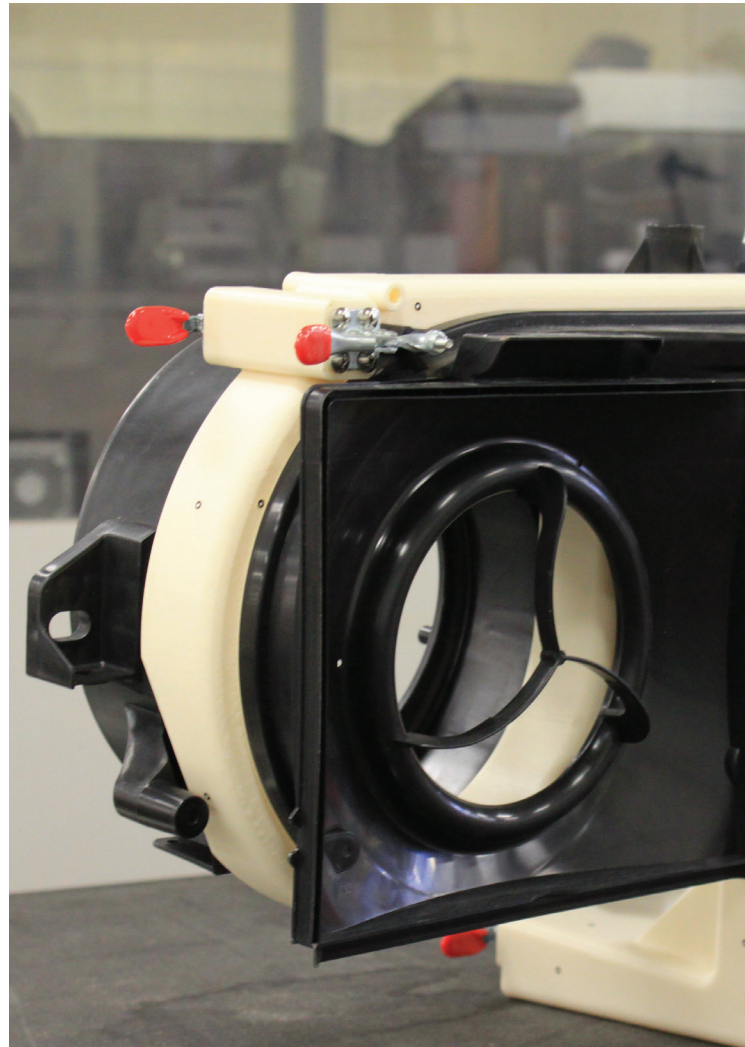
“Moving 3D printing forward within the company has been my primary motivation in doing this project,” said Joe Czach. “In the last few weeks, our eyes have been opened in terms of what can be done with it. We’re still learning from Stratasys Direct Manufacturing, and we’re hoping to continue learning with them.”

Learn more about 3D printing for jigs and fixtures and access our whitepaper [here](#).

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Jim Andersen  
Senior Project Engineer, MAHLE





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