

# Konica Minolta helps American Vehicle Conversions save time and money, and improve quality



## CHALLENGE

- Vehicle conversions often required expensive custom-built parts
- Using fibreglass moulds was costly and the quality was variable
- The cost and time to source custom parts delayed projects



## SOLUTION

- Markforged Mark Two and 3D Systems Figure 4 3D printers deployed by Konica Minolta



## CUSTOMER BENEFITS

- 3D printed parts were more cost effective and faster to produce
- Consistent and repeatable quality delivered better outcomes
- Prototyping capability reduced errors and waste when machining steel parts
- Flexibility and in-house capabilities removed the need to work with third parties
- Increased control and agility improved project outcomes and turnaround times

### **American Vehicle Conversions**

Industry: Automotive  
Location: New South Wales

American Vehicle Conversions is a car conversion specialist for American imported vehicles. It was established three decades ago to conduct a true mirror-image right-hand drive conversion process for both new and used imported vehicles. The business transfers all components over where

possible, replicating the original engineering and design of the vehicle. This includes using factory replacements parts where possible and designing and manufacturing original equipment manufacturer (OEM) quality replacement parts where required.



## Challenge

Changing left-hand drive vehicles to right-hand drive for compliance with Australian safety regulations is more complex than simply swapping all the controls over to the other side of the car. Doing so would result in an ergonomically incorrect layout with none of the controls matching up. While factory-original parts were sometimes available to help with the conversion process, in many cases, these parts simply didn't exist because the vehicle was never originally engineered to be configured as a right-hand drive.

To overcome this challenge, American Vehicle Conversions need to custom-build parts. Doing this with fibreglass moulds was expensive and time consuming and the fibreglass parts tended to deteriorate over time. The moulds also break down over time and, if just one portion isn't quite right, the entire process needs to begin again. This made the conversion process expensive and time consuming for American Vehicle Conversions and potentially frustrating for its customers.

Craig Jones, owner and founder, American Vehicle Conversions, said, "Using fibreglass was limiting and costly and it meant that American Vehicle Conversions had less control over the process. We had to work with third parties for the fibreglass component and this created even more costs, especially if something wasn't quite right.

"Something as simple as a heater box in the past could cost \$17,000 and the result wasn't always completely perfect. American Vehicle Conversions needed a better way to custom-build the parts we needed to convert vehicles in a more cost-effective manner with a more consistent, repeatable, high-quality outcome."



## The solution

The team at American Vehicle Conversions realised that 3D printing was a potential solution that could make it easier to custom-build parts at a lower cost with a higher-quality outcome. Purchasing 3D-printed parts from a supplier was a non-starter because such parts were also expensive and hard to source. Therefore, the company determined that it needed to have 3D printing capabilities in-house.

Craig Jones said, "After some lengthy enquiries about 3D printers, we discovered Markforged industrial 3D printers. These printers could use carbon fibre and Kevlar as well as fibreglass to 3D print the parts, delivering the strength we were looking for. The Markforged team put us in touch with Konica Minolta to purchase the 3D printer and get it up and running."

After purchasing the Markforged Mark Two 3D printer, American Vehicle Conversions also added a 3D Systems Figure 4 3D printer, which lets it print more detailed parts and even rubber parts.

"The Markforged 3D printers, provided by Konica Minolta, have made manufacturing so much easier and now we can do everything in-house. The printers mean we can create prototypes, make changes, and then produce the end use part, which means fewer errors and the ability to create the most effective end use part for our needs. Once we've installed and vinyl-wrapped the parts, the car looks like it has a brand-new dash."

**CRAIG JONES**  
**OWNER AND FOUNDER, AMERICAN VEHICLE CONVERSIONS**



## Customer benefits

The 3D printers have delivered significant benefits to American Vehicle Conversions, which can now avoid lengthy and expensive manufacturing processes in favour of the streamlined and versatile 3D printing process.

Craig Jones said, "These printers have made manufacturing so much easier and now we can do everything in-house. The printers mean we can create prototypes, make changes, and then produce the end use part, which means fewer errors and the ability to create the most effective end use part for our needs. Once we've installed and our look like is has a brand-new dash."

Using the 3D printers, provided by Konica Minolta, American Vehicle Conversions can make large parts by creating smaller parts to get the angles and curves exactly right, then aggregate those pieces to print up the final part as a single unit. The team is only limited by imagination at this point.

Consistency has been a major benefit, with 3D printed parts coming out exactly the same, every time. By contrast, fibreglass moulds break down after 20 to 30 runs. At a cost of \$30,000 for a mould, for example, this meant return on investment was severely limited. And, because fibreglass moulds wear each time they're used, the subsequent parts become incrementally less perfect.

Craig Jones said, "When we need steel parts, we can print up a prototype in house and take it to someone who can machine the steel parts. The prototype ensures the part will be absolutely right, which cuts down on waste and costs.

"With 3D printing, every part is a carbon copy of what would come out of the

"Working with Konica Minolta to adopt these 3D printers has been a game-changer for American Vehicle Conversions. Even for a user that isn't highly technically literate, the machines are easy to use and Konica Minolta provides excellent training and support."

**CRAIG JONES  
OWNER AND FOUNDER  
AMERICAN VEHICLE CONVERSIONS**

factory and the parts work perfectly without the issues in their service life that can be seen from fibreglass-moulded parts. To be able to produce parts at the same quality and detail through plastic injection would be hundreds of thousands of dollars and the business could never afford that; nor would we ever need that kind of volume."

If a new part is required, it's as simple as drawing it and printing it up. Once the drawing is done, the part can be produced as many times as it's needed, saving time and money. American Vehicle Conversions can ensure that often-used parts are on hand for upcoming jobs, which also helps deliver a superior customer service.

Craig Jones said, "We used to have an issue where the centre mirror on the windscreen didn't come out far enough to work for a right-hand drive, which was inconvenient. We've 3D-printed a small cylinder that pushes it out a little further so it works well; however, without the 3D printer it would have been impossible to make anything precise enough to click into the mirror to do that. This is a small example of how we focus

on the details to make the conversion more professional."

The heater box that used to cost \$17,000 now costs just \$2,200 in material costs with the 3D printing process. And, as car designs change every couple of years, being able to 3D print new parts means American Vehicle Conversions won't get caught with too much stock of a superseded part on hand.

Craig Jones said, "The little things that we can quickly draw and print out have made the conversion process so much easier in many small ways as well as the overall impression that's created with such a professional conversion. It has been very handy for the business. It decreases the time it takes to turn a vehicle around and means we don't have to worry about the quality of a third-party provider's work.

"Working with Konica Minolta to adopt these 3D printers has been a game-changer for American Vehicle Conversions. Even for a user that isn't highly technically literate, the machines are easy to use and Konica Minolta provides excellent training and support."