

# AUTOMOTIVE PERFORMANCE SOLUTIONS

## BUILDING NEW FORD GT40s WITH SOLIDWORKS



Using SOLIDWORKS Premium design and analysis tools, APS has accelerated design, production, and assembly of custom modern versions of the classic Ford GT40 sports car, which first appeared in the 1960s at the 24 Hours of Le Mans, the world's oldest active endurance race for sports cars.



### **Challenge:**

Streamline the design and assembly of modern replicas of the classic Ford GT40 sports car while simultaneously supporting automotive engineering consulting.

### **Solution:**

Implement SOLIDWORKS Premium design and analysis software.

### **Benefits:**

- Cut design cycles by 50 percent
- Reduced development costs by 30 percent
- Decreased assembly time by 40 percent
- Minimized design errors

Automotive Performance Solutions—Roaring Forties (APS) is an Australian automotive engineering consultancy that produces custom modern versions of the classic Ford GT40 sports car. The firm, which was established in 2004 by a group of enthusiastic mechanical engineers who share a passion for Ford GT40 racing vehicles, also provides design and engineering services to leading automotive companies and original equipment manufacturers (OEMs).

The Ford GT40 was developed by the Ford Motor Company in the 1960s to challenge the dominance of Ferrari automobiles at the 24 Hours of Le Mans, the world's oldest active endurance race for sports cars. With its classic shape and lines, the Ford GT40 is a timeless model still in demand by automobile aficionados around the world. APS was founded to support this market by implementing advanced technologies, such as 3D CAD modeling, finite element analysis (FEA) simulation, and a coordinate measurement machine (CMM) for suspension pickup points, to build the best, most modern, and most drivable GT40 replicas available.

"Many car buffs consider driving a Ford GT40 to be 'driving the dream'—it is unlike many of the other race cars that were developed to compete at Le Mans because it translates well into a timeless and beautiful road car," explains APS Business Development Manager Ivan Viduka. "However, unlike other replica or antique car companies, our approach is to design and build an entirely new version of the GT40 without disrupting the classic body shape. Our customers get the performance of a modern underbody—including the drivetrain and suspension—combined with the classic period interior and exterior components that they love."

APS originally used 2D drawings to work with machine shops to create components, a process that was both slow and costly. To efficiently and cost-effectively develop GT40 replicas bearing modern parts and mechanicals, APS needed an integrated 3D development platform. "As a low-volume replica car manufacturer, we needed the flexibility of an all-in-one mechanical package that would enable us to quickly and affordably design, validate, and produce new parts and assemblies," Viduka recalls. "We found that package in SOLIDWORKS® Premium software."

APS standardized on SOLIDWORKS Premium design and analysis software because it is easy to use, automates many processes, and includes integrated FEA analysis tools. "Producing parts and building cars without encountering assembly and durability surprises is the area where we really need a robust 3D CAD tool to check dimensional accuracy, confirm component stiffness, and maintain high levels of assembly quality," Viduka notes. "With SOLIDWORKS Premium software, what you see on the screen is what you get, as our models correlate very well with the prototype builds."



**"With the automation that SOLIDWORKS Premium software provides, we've cut our vehicle assembly cycle times nearly by half and improved quality along the way. In fact, we can leverage the dynamic motion, interference detection, and FEA analysis tools of SOLIDWORKS Premium software to increase the assembly accuracy and meet our performance targets for both components and assemblies."**

— Ivan Viduka, Business Development Manager

### **QUICKLY DEVELOPING QUALITY PARTS FOR AGELESS CLASSIC**

Using SOLIDWORKS Premium design and simulation tools, APS can more quickly and accurately design, validate, and fabricate new parts for its GT40 replicas, resulting in shorter design cycles, customizable designs, and improved build quality. "When you are designing automotive components for low-volume sports cars, you need flexibility without compromising quality," Viduka says.

"With the automation that SOLIDWORKS Premium software provides, we've cut our vehicle assembly cycle times nearly by half and improved quality along the way," Viduka continues. "In fact, we can leverage the dynamic motion, interference detection, and FEA analysis tools of SOLIDWORKS Premium software to increase the assembly accuracy and meet our performance targets for both components and assemblies."

## SAVING TIME, REDUCING COSTS

SOLIDWORKS Premium software also has enabled the low-volume replica car manufacturer to cut its development costs by 30 percent and car assembly time by 40 percent. "Because SOLIDWORKS Premium software allows us to design, validate, fabricate, and assemble our cars more quickly, we reduce labor time and associated costs," Viduka stresses.

"For example, our chassis are hand-built and riveted together," Viduka adds. "Using the Hole Wizard in SOLIDWORKS, we don't have to spend time measuring and indexing holes to space rivets and attachment points, as the software accurately enables tolerancing checks and uniform spacing of hole locations. Integrated simulation tools in SOLIDWORKS Premium also enable us to conduct the structural checks, such as natural frequency and fatigue analyses, that minimize prototype iterations."

## SUPPORTING AUTOMOTIVE ENGINEERING BUSINESS

In addition to helping APS streamline development and assembly of its Ford GT40 replicas, SOLIDWORKS Premium software provides the design and analysis tools that the company needs to support its automotive engineering consulting side of the business. "Our GT40 replicas are rolling business cards for our automotive engineering expertise," Viduka points out.

"We've completed consulting projects for General Motors, Ford, Kenworth, and several Chinese OEMs," Viduka says. "SOLIDWORKS Premium provides us with the design and analysis tools that we need to complete consulting projects that require advanced package engineering, durability, and testing program support through specialized certification for modifying race and show cars for road use."

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APS relies on SOLIDWORKS Premium software to automate development, prototyping, validation, production, and assembly, saving the company time and money in the process.

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