

Application Example: 3D Scanning, Reverse Engineering, Additive Manufacturing

Traditional panel beating meets advanced manufacturing – 1955 Porsche 550

Measuring Systems: ATOS Core 500

Manufacturing Systems: UP Box

Keywords: Tool optimization

Through a collaboration with respected restorer, coach builder and director of Lindsay Fox's Museum, Brian Tanti, Scan-Xpress has engaged with an exciting project which synthesizes traditional and advanced manufacturing. The project is focused on the restoration of a rare 1955 Porsche 550.



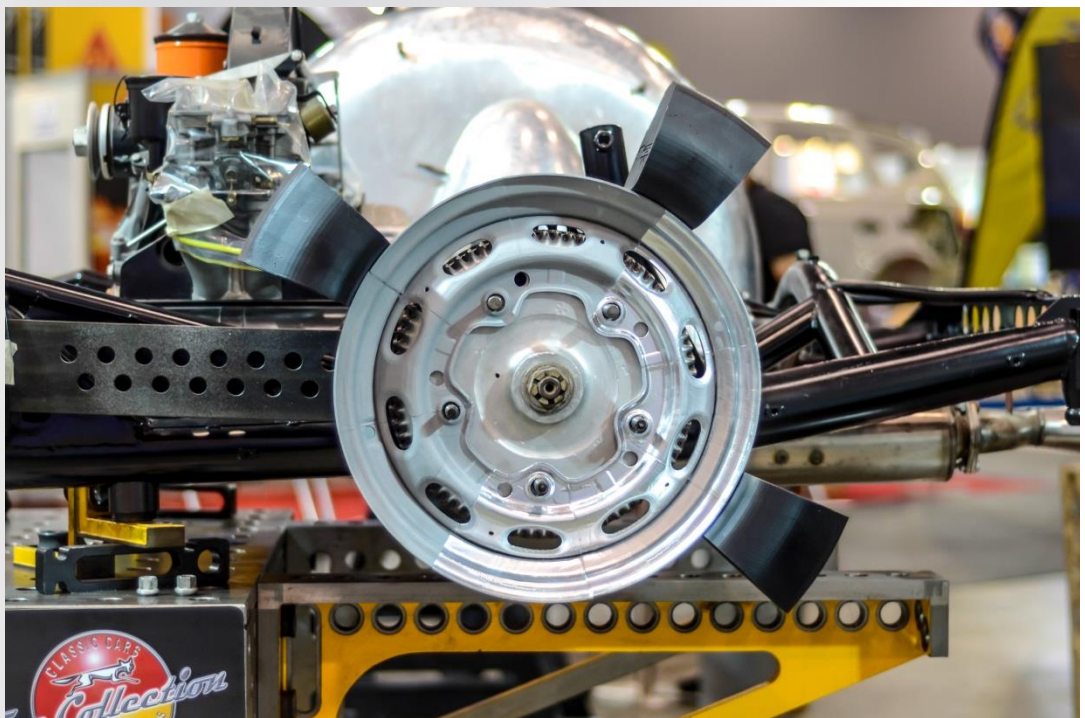
As part of the restoration a new mudguard will be hand shaped by Brian himself. Traditionally this panel would be shaped around a hand modified mark-up of the original wheel and tire profile to ensure clearance. In order to improve this antiquated process Scan-Xpress opted to digitize the wheel using an ATOS Core 500 non-contact optical sensor. The scan data was then reverse engineered to provide mathematically accurate representation of the wheel and the model was 3D printed.

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Original hand modified wheel (wood section describe the tire profile)

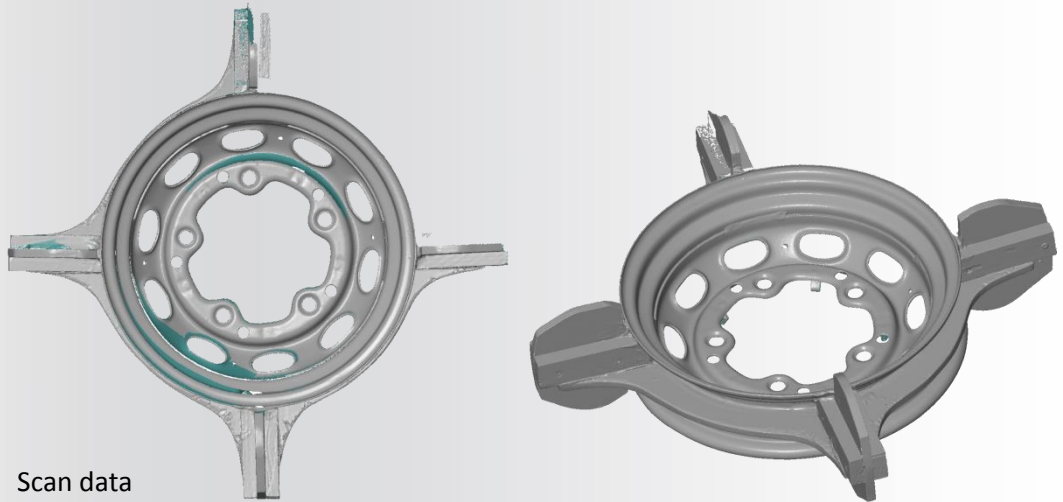


3D printed ABS plastic wheel with tire profiles attached

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Approximately 90% of the rim was scanned in order to create a model for the reverse engineering process. Due to the symmetry of the component a complete scan was not required. The wooden tire sections were scanned as well as the inflated tire itself.



Scan data

Reverse engineering was completed to a medium degree of accuracy with the allowable tolerances set to ± 0.5 mm. The finished CAD model is shown below.



CAD Model

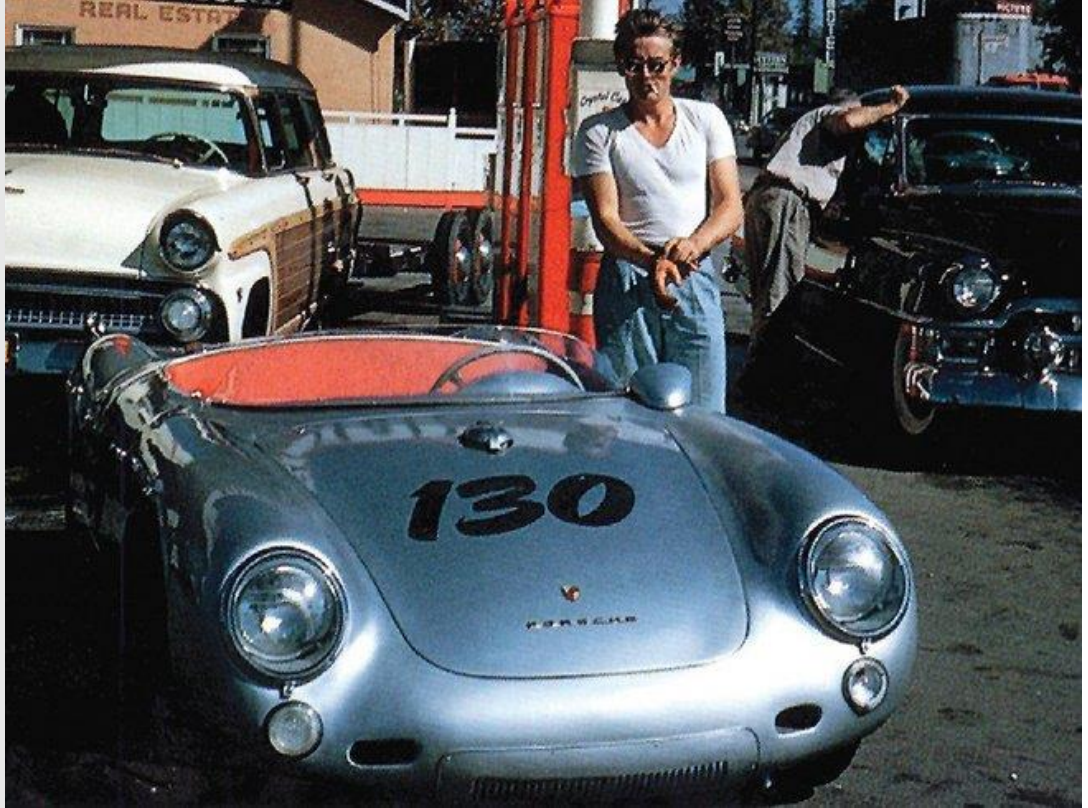


The model was then separated in eighths allowing each section to fit inside the build volume of our in-house 3D printer. The parts were printed in 'turbo' mode with a layer thickness of 0.15 mm. The material used was ABS plastic. The individual sections were chemically welded together and the finished product was given a coat of spray paint.

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The new 3D printed wheel and tire sections enabled Brian to fabricate the mudguard with confidence, knowing that the finished panel would have the appropriate wheel clearance.



James Dean and his iconic Porsche 550

