

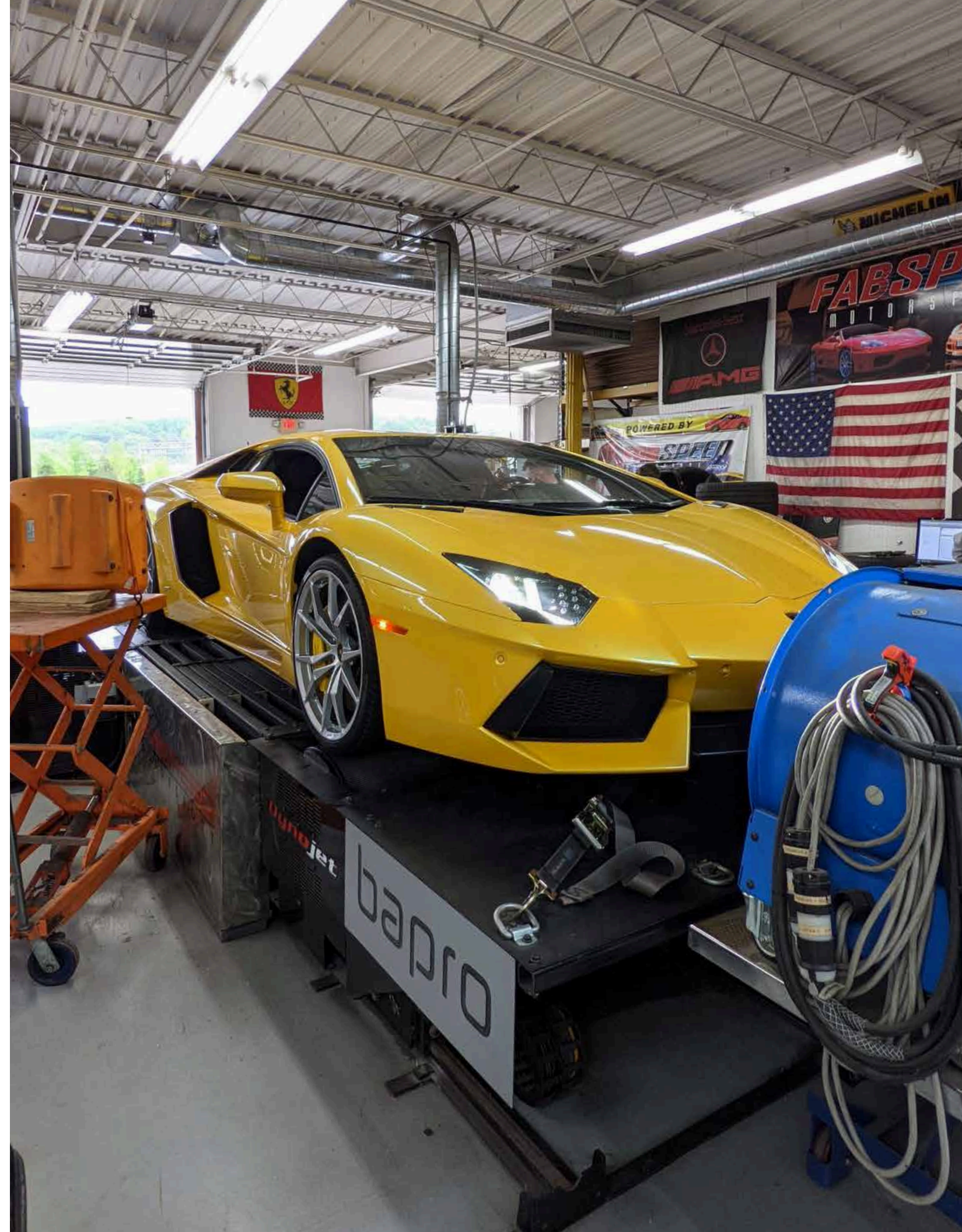
Sam Gearhart

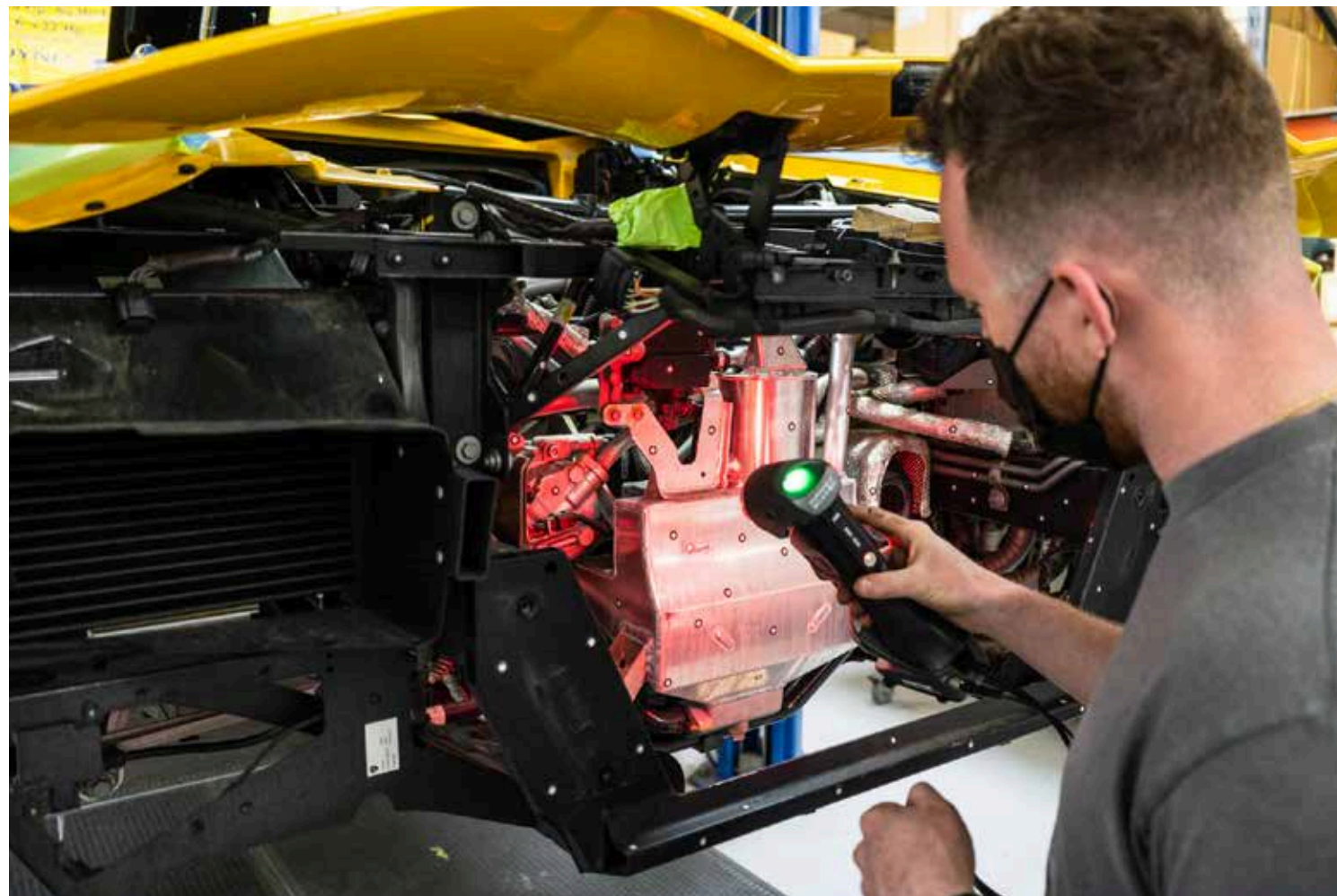
Lamborghini Aventador Valved Exhaust

Fabspeed Motorsport was granted an opportunity to redesign a previous product using design technology and digital reverse engineering tools that were not available when the product was originally introduced.

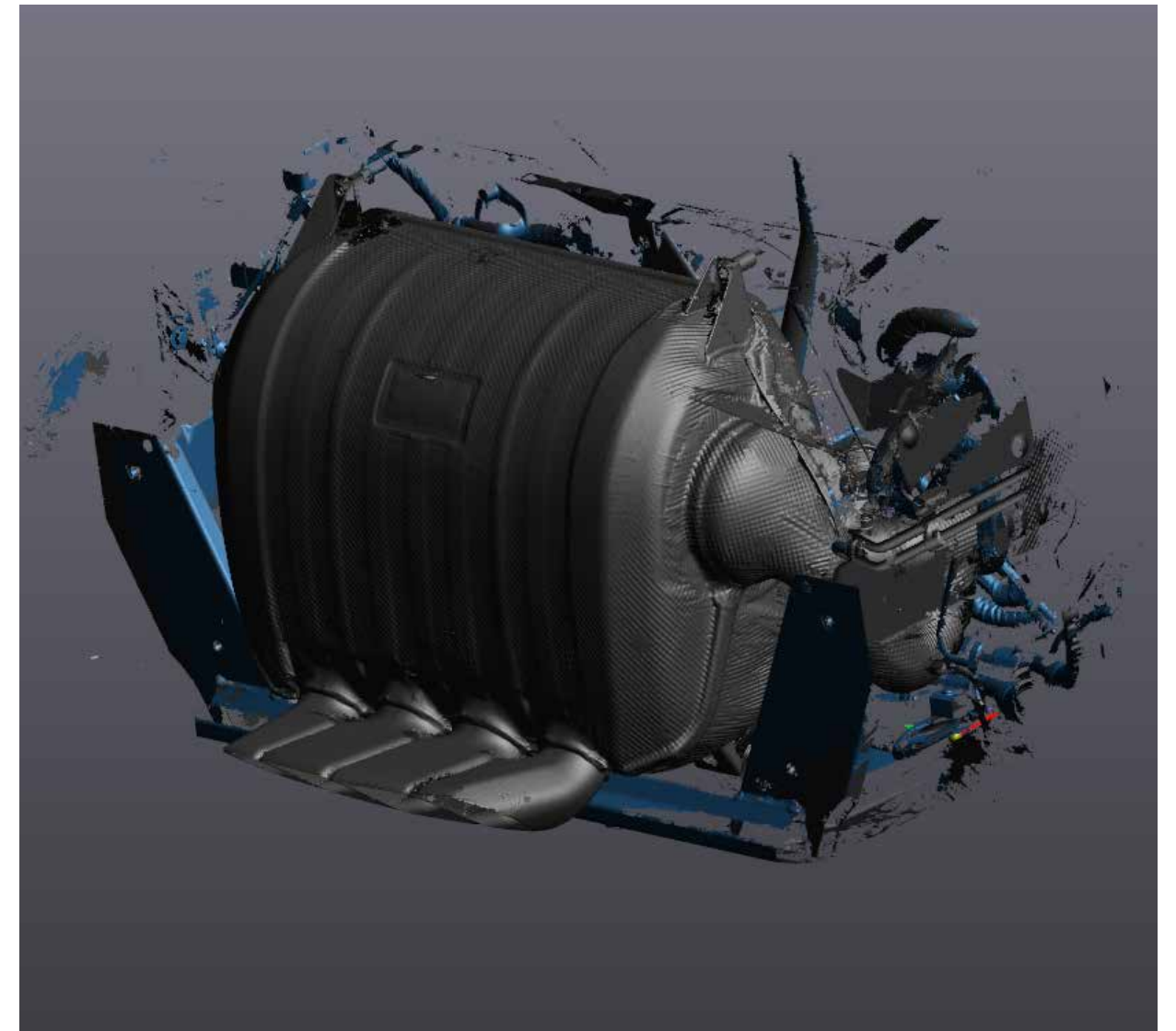
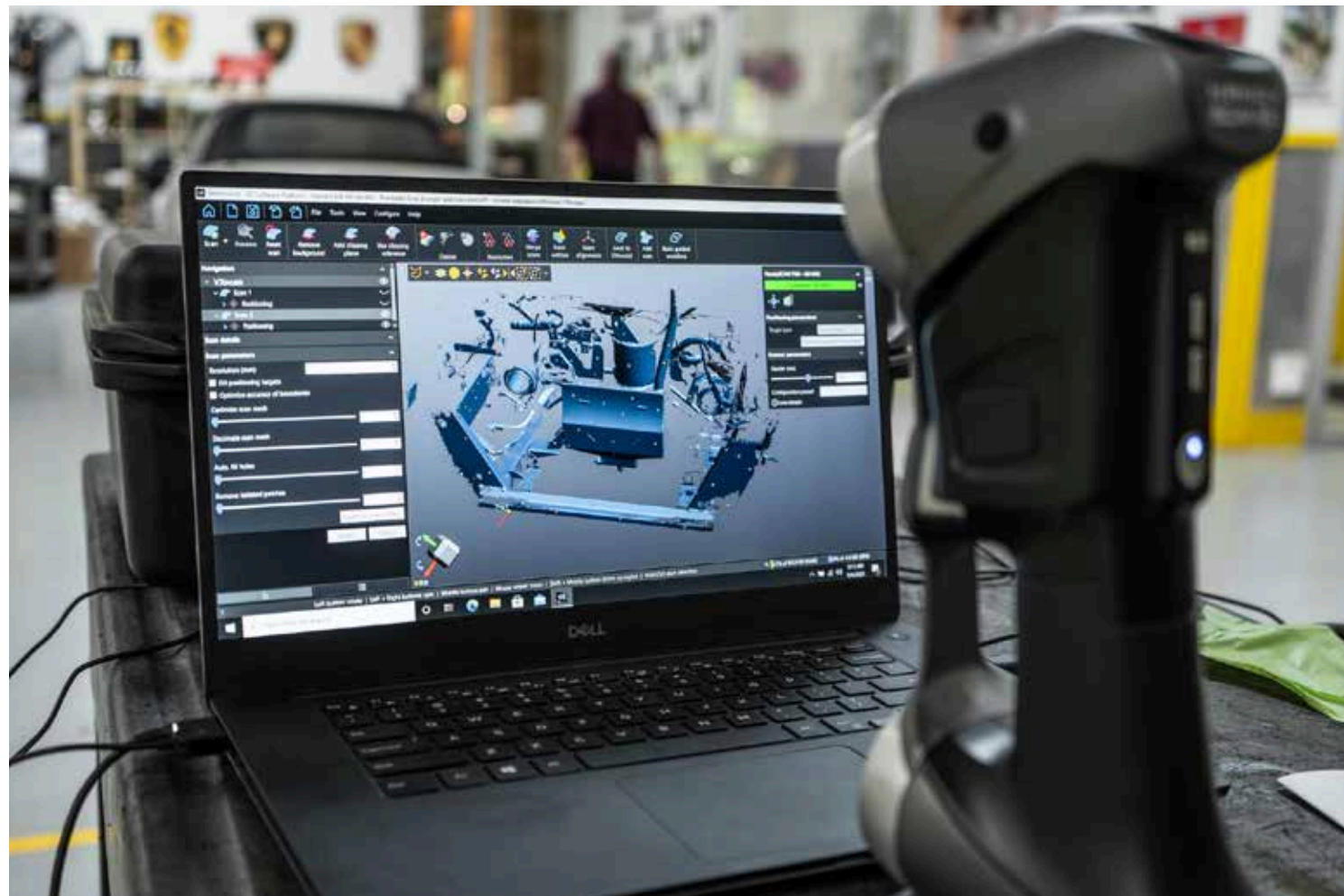


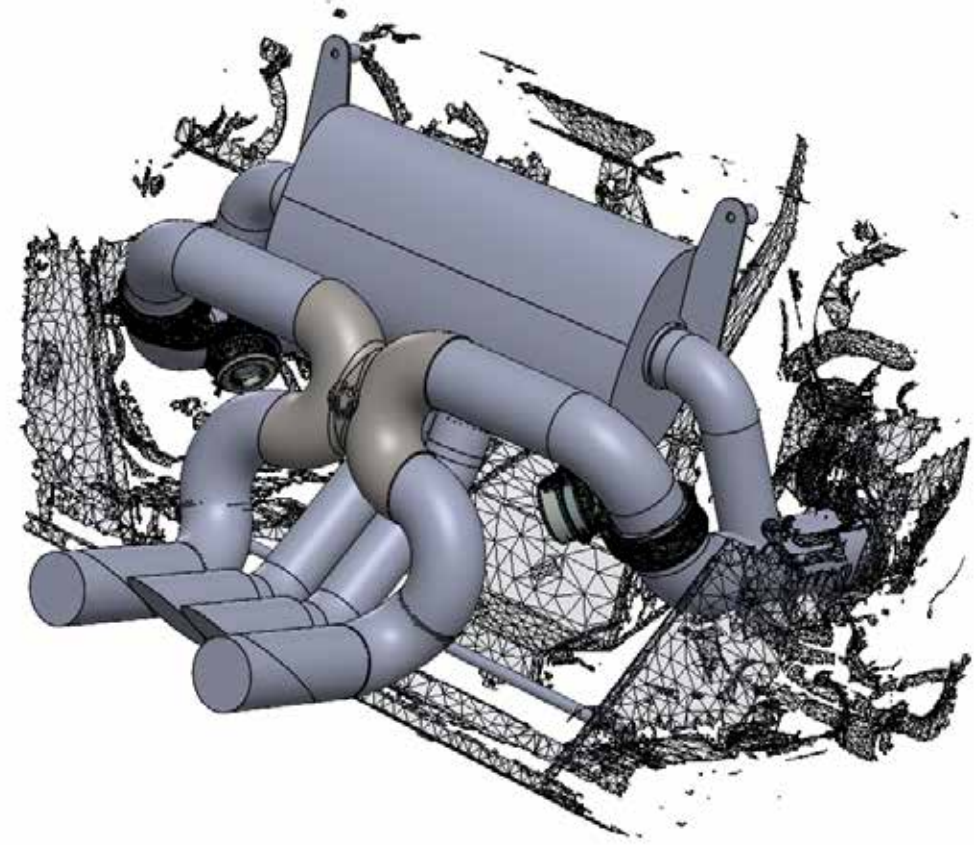
This two week project started with a baseline run on the dyno to collect initial power numbers. The all wheel Dynojet dynamometer used to gather these numbers has a weather station attached to take into consideration atmospheric pressure, elevation and ambient temperature to correct the numbers all to the same levels. This allows for consistency in numbers even when there are days, or weeks between tests.



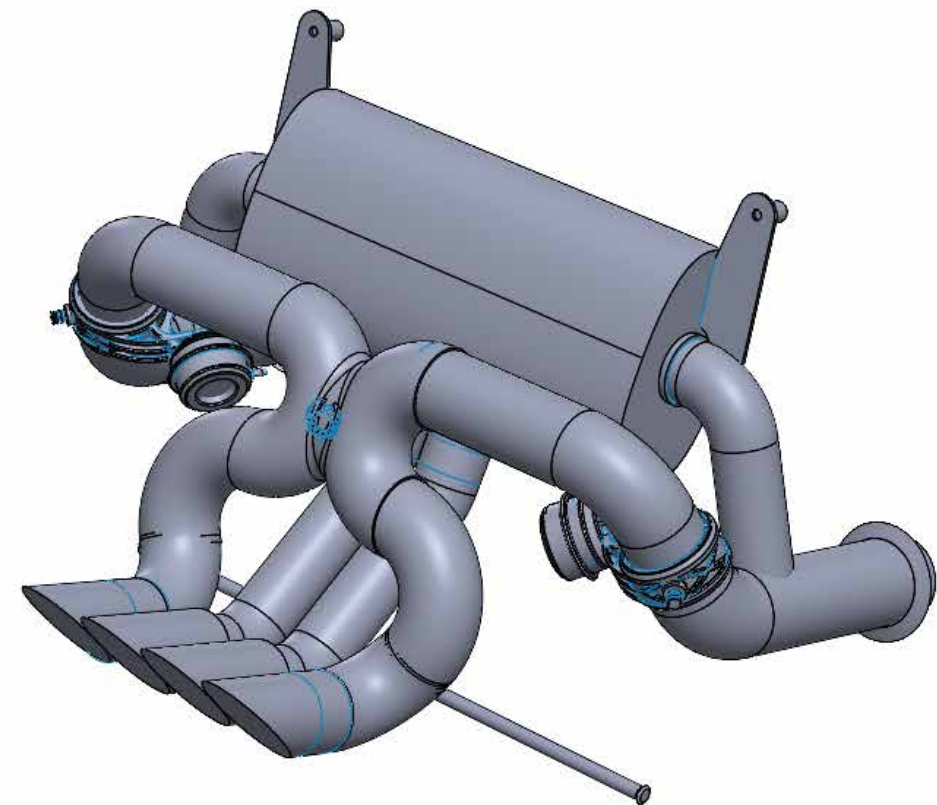


The car is scanned to obtain a digital mesh of the complete exhaust envelope. Attention must be paid specifically to the original mounting points, areas of tight clearances and factory inlets and outlets to ensure that the exhaust system will effortlessly fit up to any factory exhaust components up stream and mount using factory hangers and heat shields.

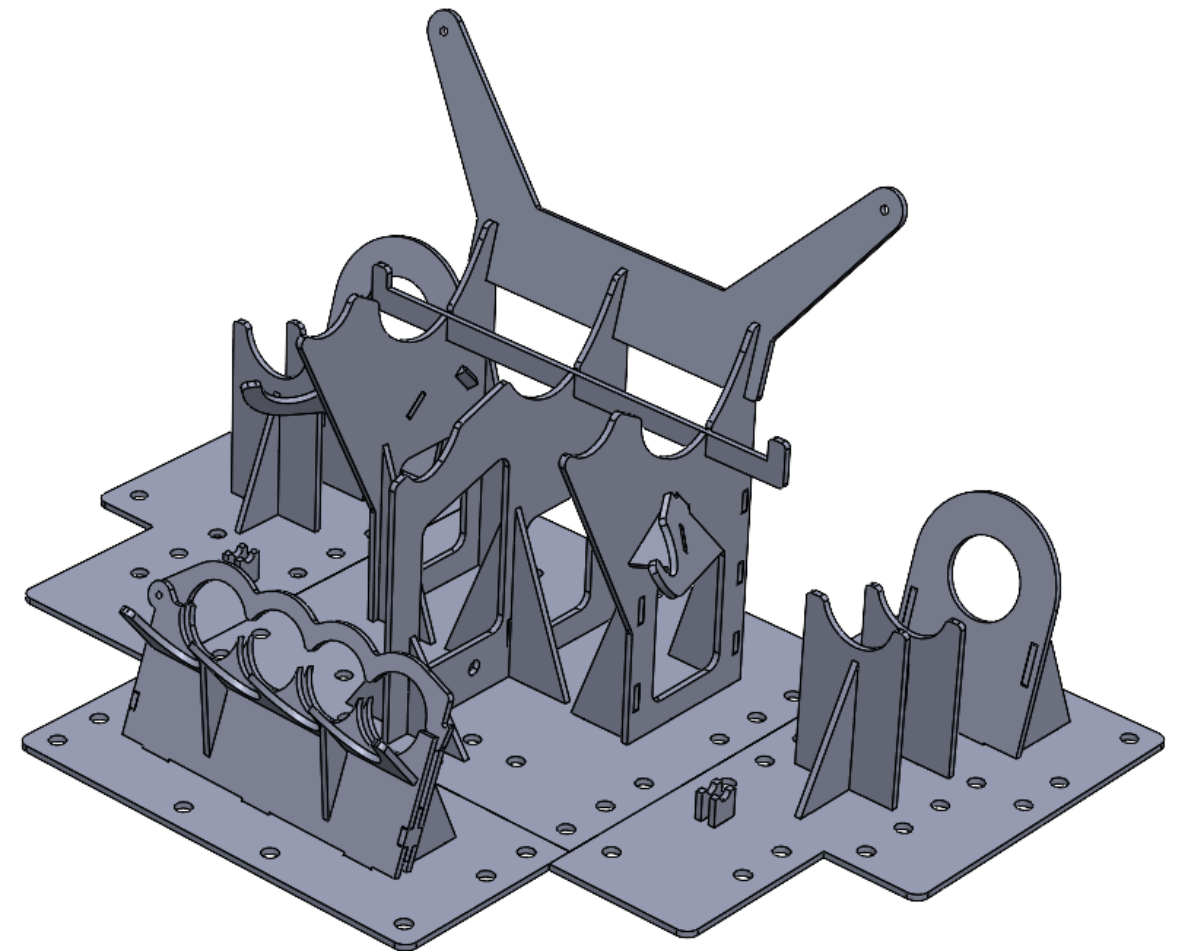
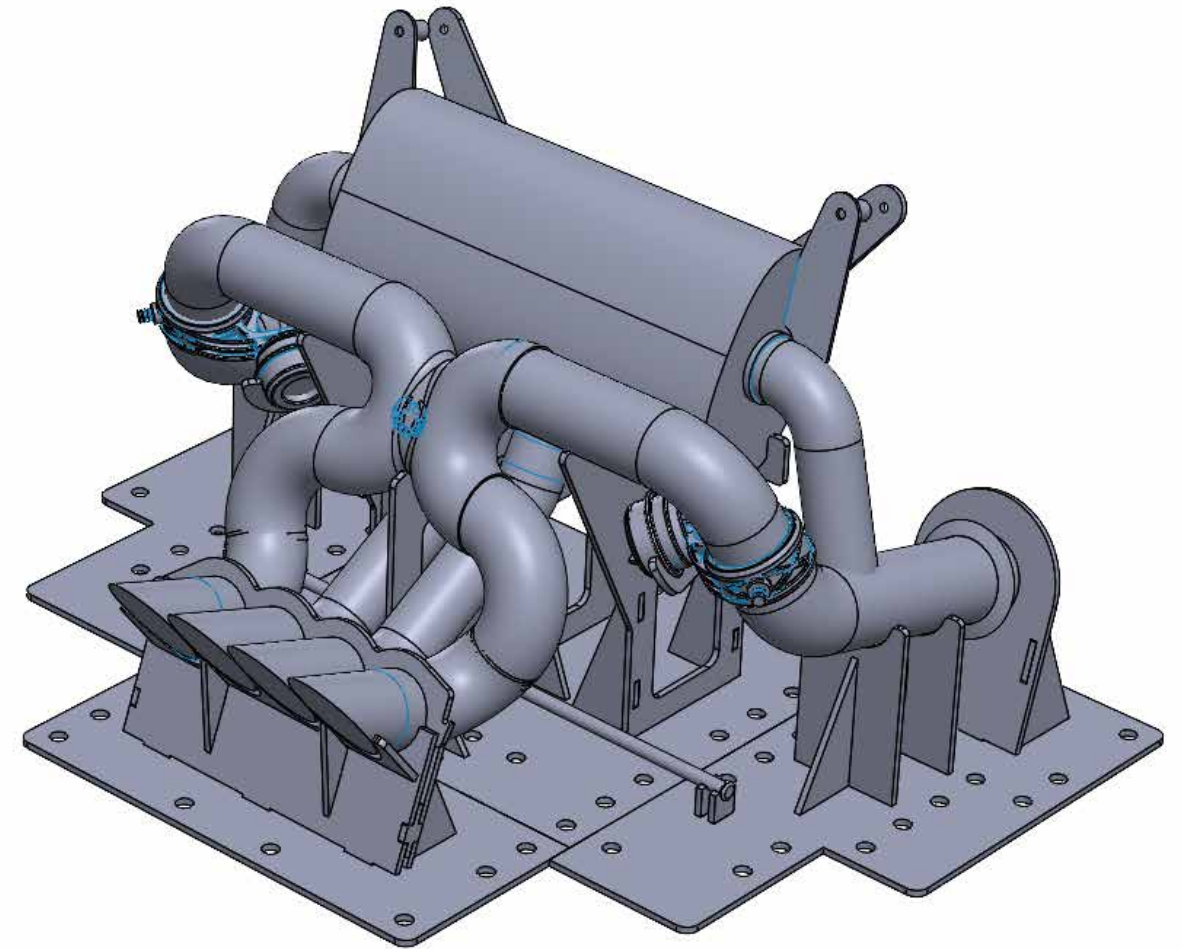




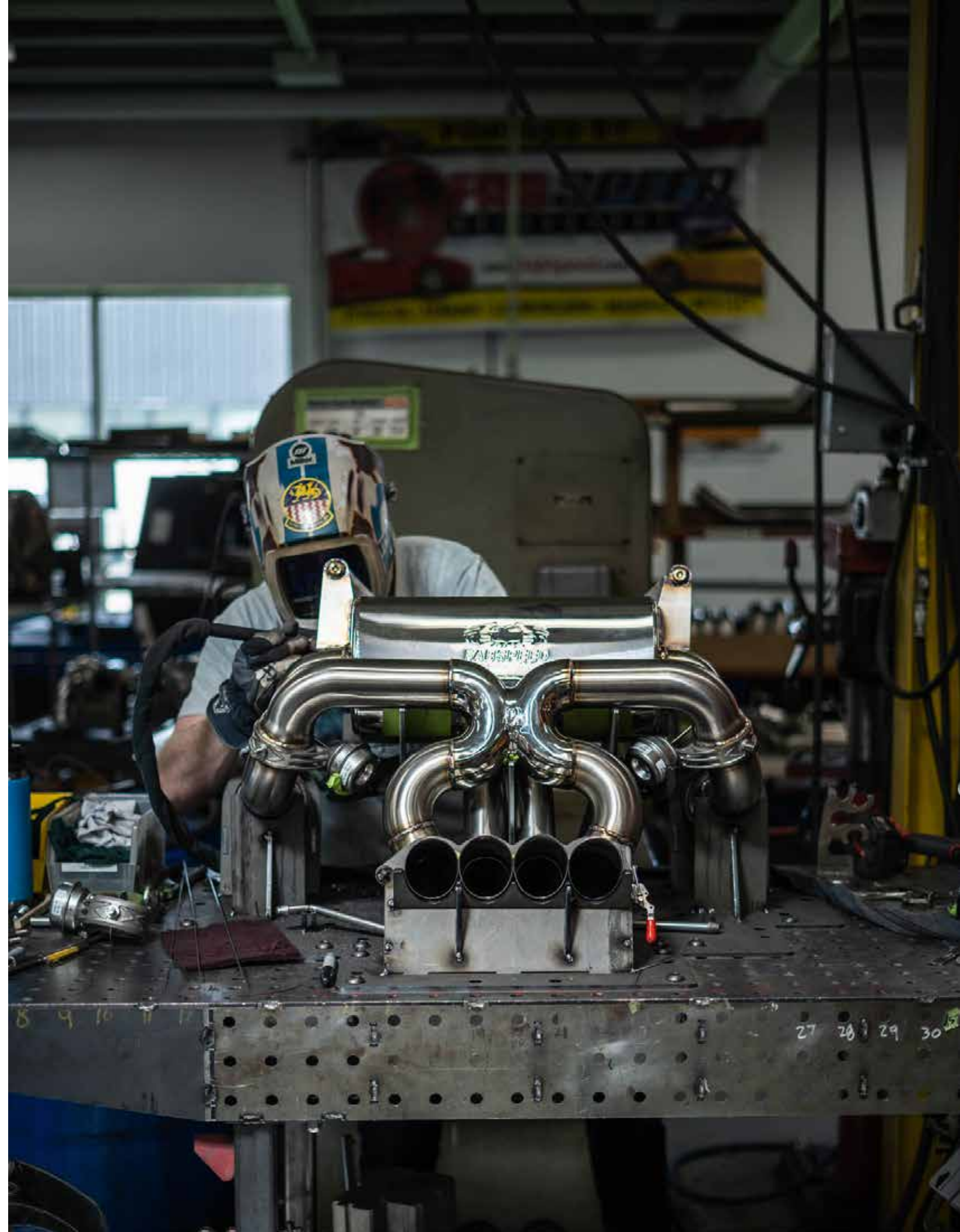
The exhaust system is built in Solidworks utilizing the data from the scans. This allows for quick ideation that minimizes material waste while also ensuring that the final product will fit in the space available in the car. All bends are modeled with consideration to available CNC mandrel bender tooling and required minimum distance between bends to decrease unnecessary welds.



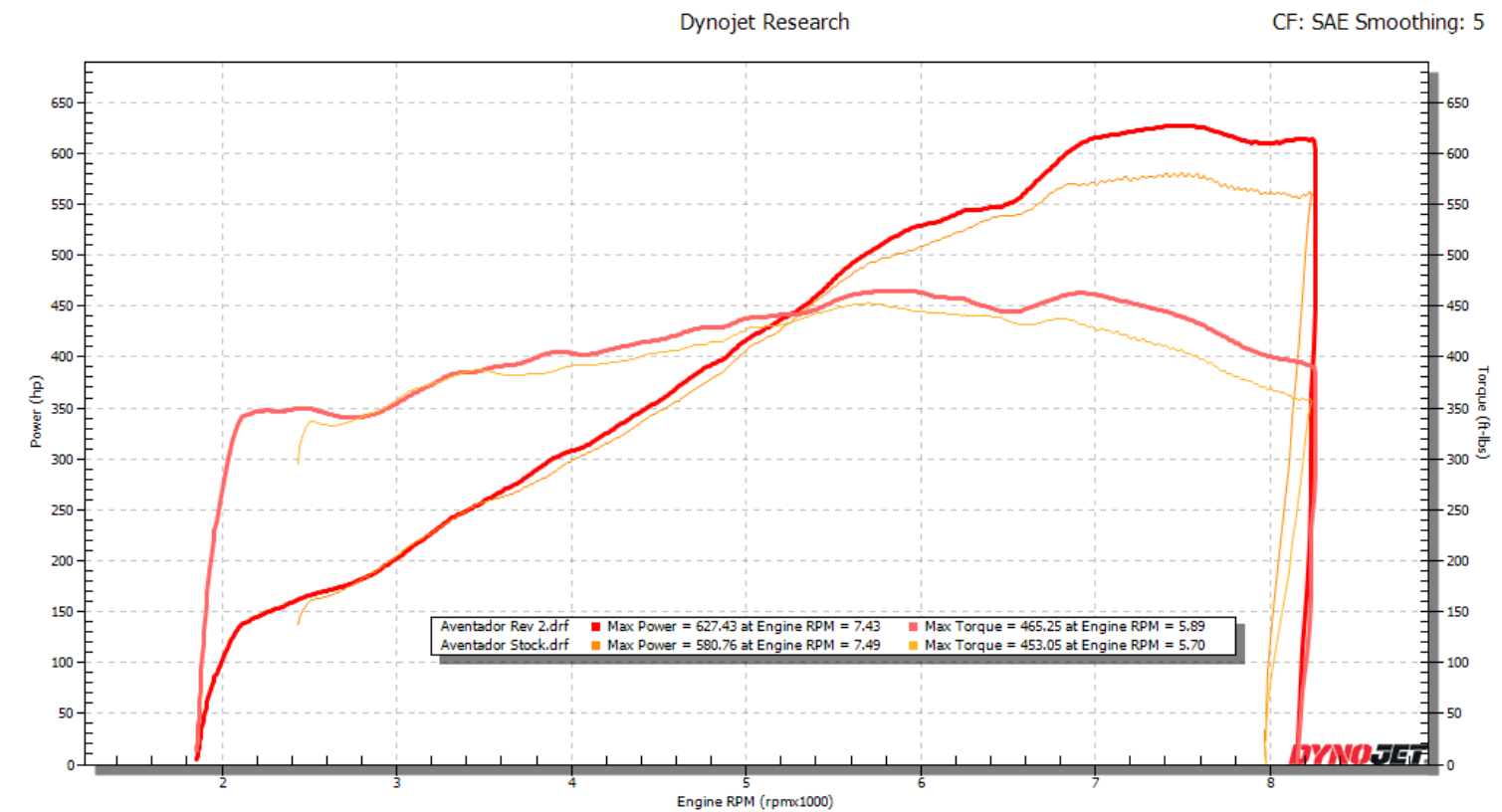
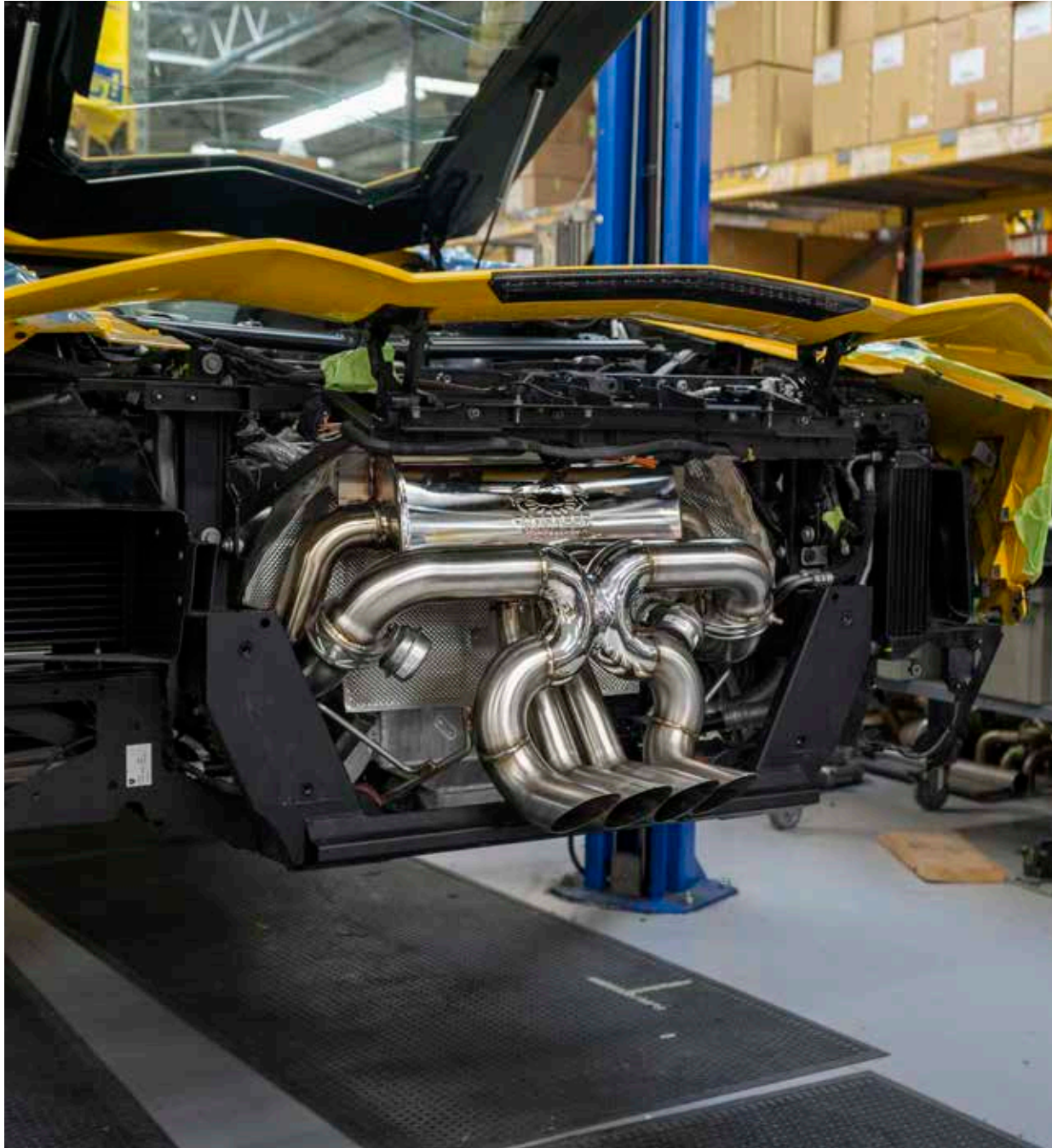
A fixture is designed to build the exhaust in. To be manufacturable the exhaust must be repeatable and leave little chance for error. All areas that require tight tolerances are enforced with multiple cups and clamps. It is important to have an understanding of welding practices to create a fixture that allows an exhaust to be built with ease.



The fixture and exhaust are then assembled. The laser cut steel pieces are then assembled using the gussets and tab and slot features designed to locate them. Bends are prepped and templates are made to expedite the manufacturing process when in production. Any helpful tips learned while fabricating will be noted and added to the production traveler.



The completed exhaust is installed and tested. Just like when the car originally came into the shop 10 days prior, the car is again dyno tested as well as road tested for any unexpected negative attributes in performance or sound. This testing is down in low and high load scenarios to insure a thorough investigation of driving scenarios.





The final product.

+47 horse power.

+12 foot pounds of torque.

-21 pounds versus OE.

Build time reduced by 5 hours.

Enhanced Italian V12 sound.

Perfect fitment.

