One Lap of America: A Real-World Test for Toyota Engineers

July 29, 2021

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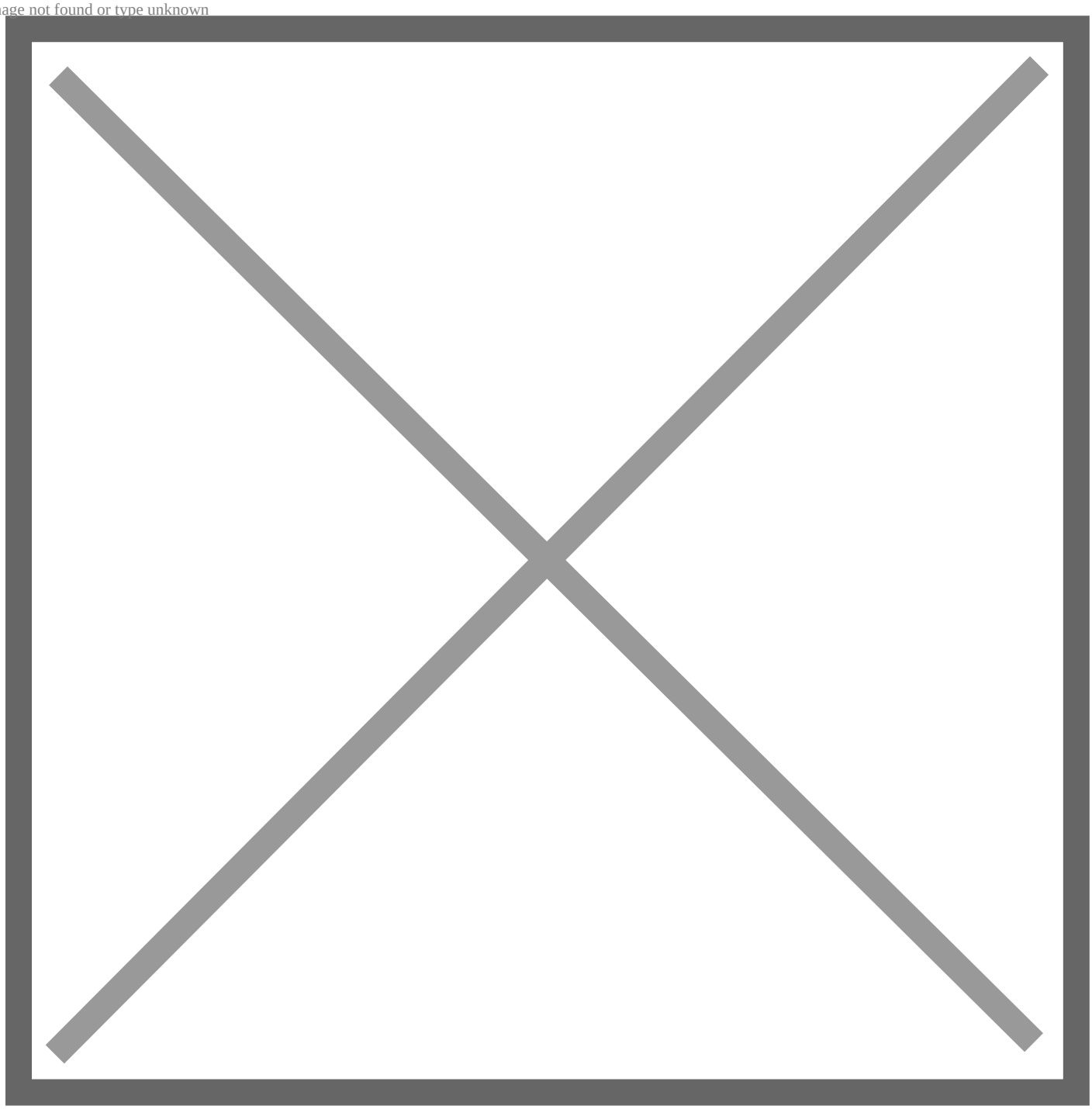
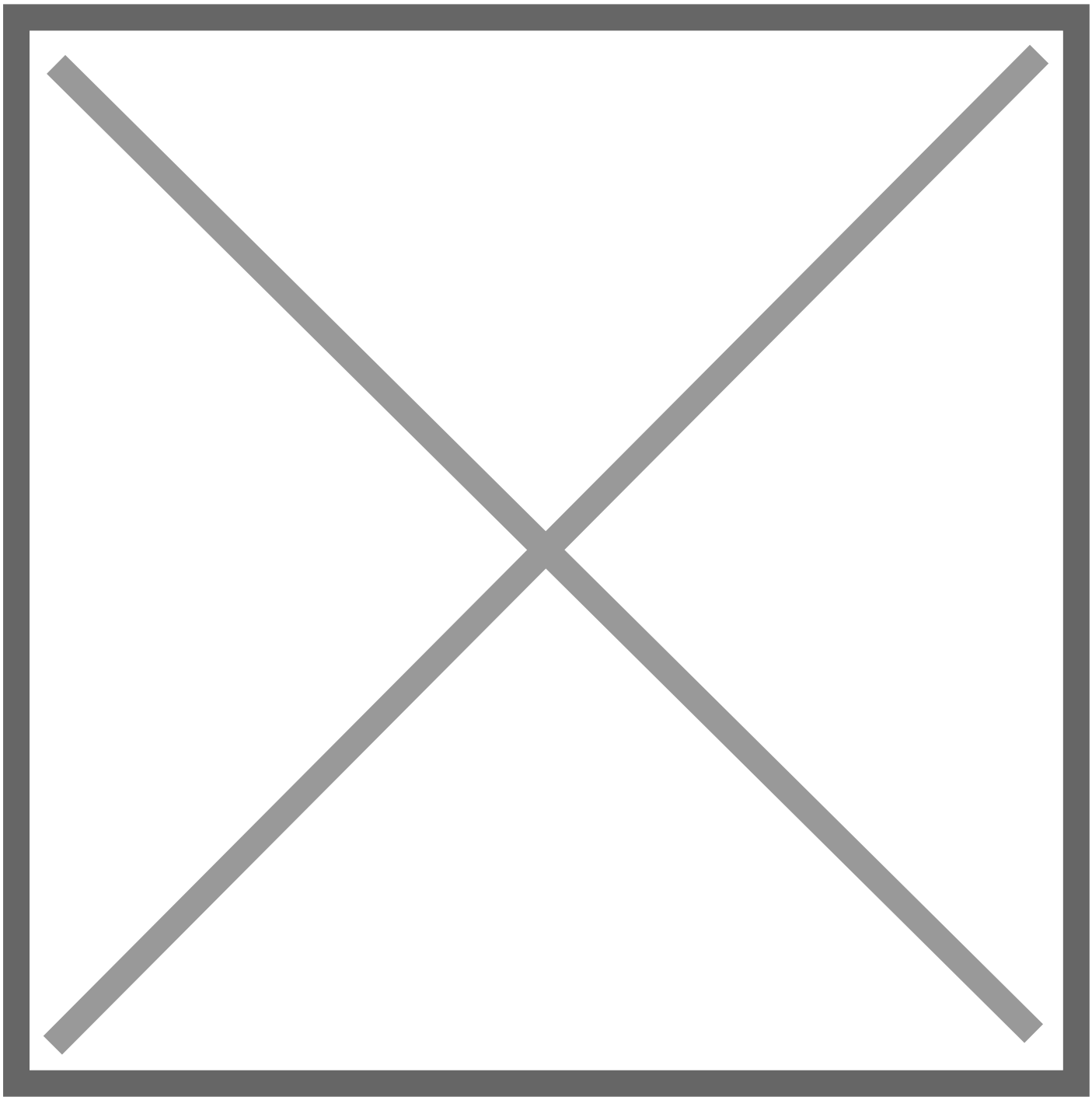


For months, Toyota Motor North America's Production Engineering Motorsports Team prepared for the Tire Rack One Lap of America 2020. The crew was excited about the modifications they planned to make to their fleet to improve competitiveness in the upcoming event.

But then the unthinkable happened: An unprecedented pandemic in early 2020 resulted in a nearly nationwide halt of outdoor and indoor activities, including the annual 10-race contest — the first cancellation in the event's 37-year history.

"We finally felt like we had an extremely competitive package that would be eye-opening, in the Camry," says Andrew Brownfield, a Toyota final assembly engineer. "So, we got all these components at the shop ready to install. And then the rug was pulled out from under us. COVID hit and we basically had to stop all vehicle preparation."



Those components sat on workshop tables and shelves throughout much of last year. “It was really a harsh reminder,” says Brownfield. “Every time you walked down to the shop and you’d see a table full of parts sitting there.”

So, naturally, the team felt a great deal of anticipation as the 2021 event approached.

“We were so excited to run after [2020] being shut down,” says Brownfield, who drove the #88 modified Camry XSE that finished 3rd in class and 31st overall among 80 competing vehicles.

Brownfield, who just completed his fifth One Lap of America, is part of a nine-member production engineer motorsports team at Toyota's Production Engineering and Manufacturing Center (PEMC) in Georgetown, Kentucky. The team also entered a showroom 2021 Toyota GR Supra and a modified 2013 Toyota "86" in this year's race.

The Competition

The competition, which ran from April 30 to May 7, stretched over 3,500 miles beginning in South Bend, Indiana. The seven-day trek reached Tennessee, Texas, Louisiana, Georgia, West Virginia, and Michigan before circling back to its Indiana starting point.

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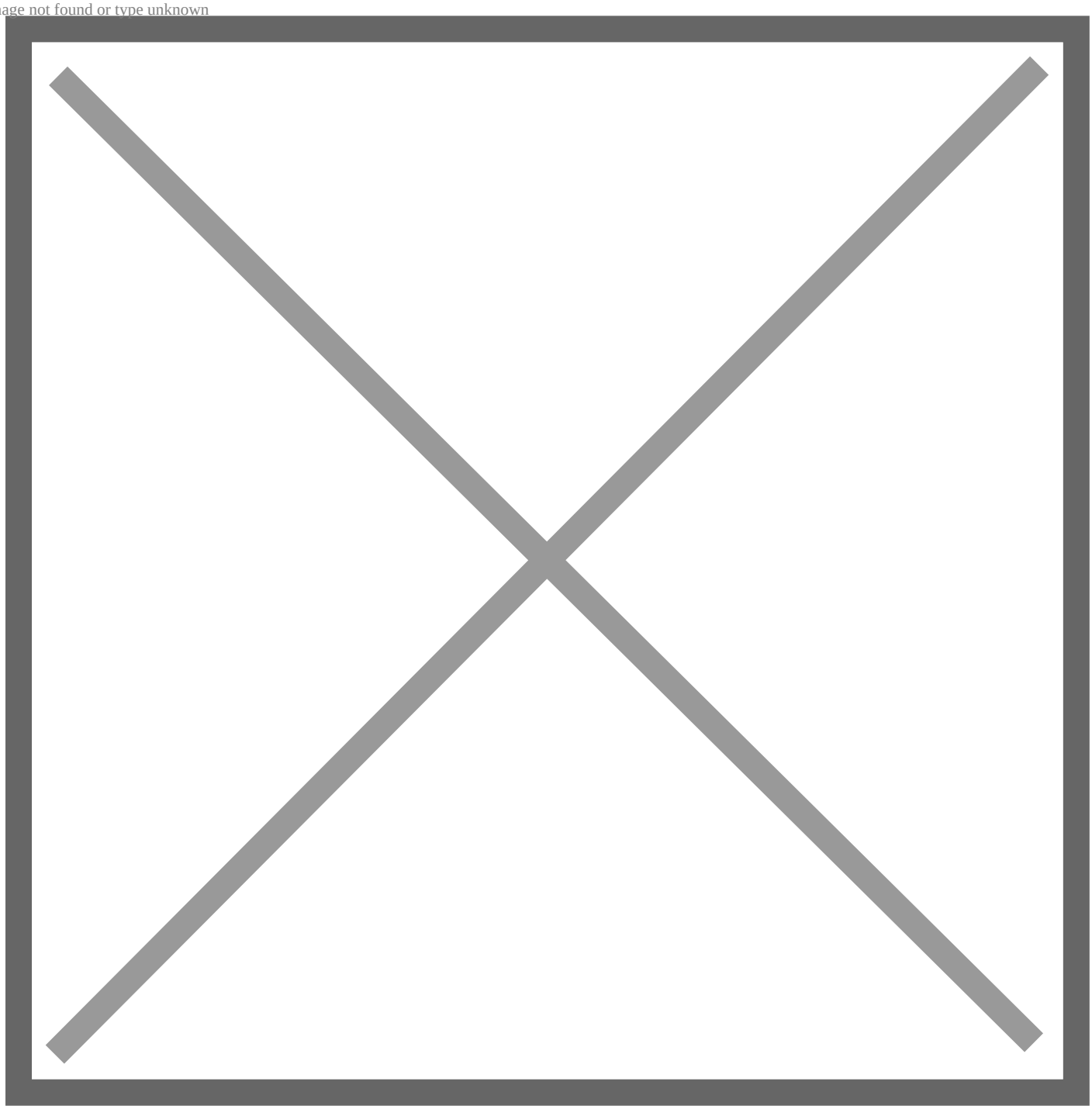
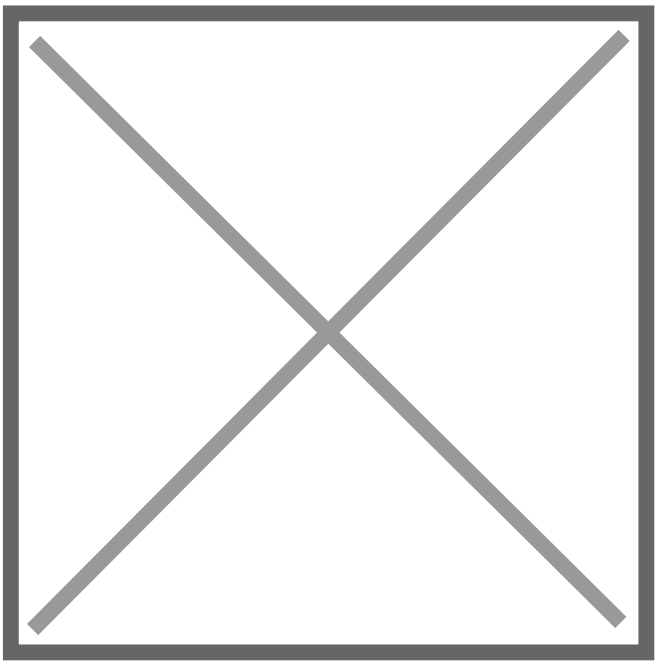


One Lap of America is described as a road rally race for driving enthusiasts and is considered a modern successor to The Cannonball Run, a race across the country from New York to California with one simple rule: “All competitors will drive any vehicle of their choosing, over any route, at any speed they judge practical [within legal requirements], between the starting point and destination. The competitor finishing with the lowest elapsed time is the winner.”

The idea of this race was first proposed by then unknown automotive journalist Brock Yates in Car and Driver magazine, and would eventually grow into the annual event we know today.

For Toyota, it’s an opportunity for engineers to put its vehicles to the test on the racetrack and real-world driving situations. The modern-day event features a series of competitions at racetracks across the country including drag racing, multiple road courses, and autocross — a technical short-distance time trial that rewards precision driving and good car control.



Finally Ready to Roll

In December 2020, when states began reopening amid vaccination rollouts, the engineers picked up where they left off. Among steps taken to ensure that it was safe to work inside the shop: UV light ovens were installed to sanitize tools between uses and a limited number of people were assigned to designated work zones to maintain social distancing.

Toyota crews at other North American Manufacturing Centers (NAMCs) including the Indiana facility and the West Virginia transmission plant followed suit. Once protocols were in place, the teams resumed work on the cars.

A major priority for the PE Motorsports Team was to level up the competitiveness of the Camry. The team benefitted from close collaboration with DG-Spec to hone in vehicle setup, and employees at Toyota’s transmission manufacturing plant in West Virginia (TMMWV) supported by building a custom powertrain for the car. These changes demonstrated not only the capability of Toyota’s engineers, but also showcased the performance of the best-selling passenger car in the U.S., on racetracks. The Camry — known for its reliability, gas efficiency, and style, received new wheels, tires, and brakes, and an updated suspension for increased handling and grip. The car also received a custom aerodynamics package including a NASCAR-grade carbon thermoplastic front splitter.

The A91 GR Supra competed as-is with minimal performance modifications, with the exception of safety upgrades including a 4-point harnesses and fire suppression system, in order to showcase the from-the-factory performance, and capture baseline data that will inform decisions regarding future upgrades. The #91 Supra, driven by production engineer Kirk Barber, finished second in class and 18th overall with stiff competition from

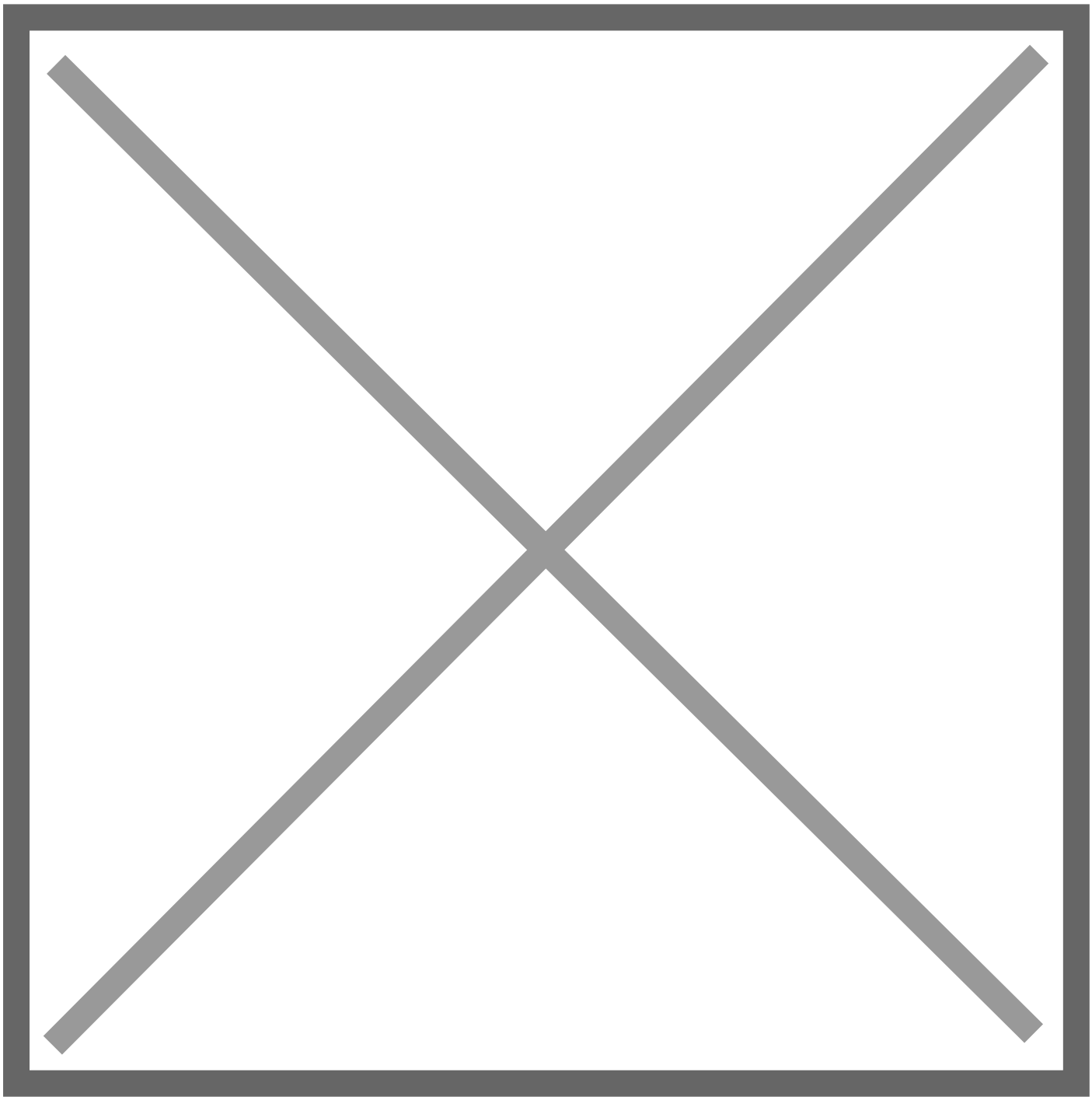
more expensive and heavily modified vehicles including the 2019 overall winner, an all-wheel drive 600-horsepower Audi TT-RS.

“The GR Supra performed incredibly well, far exceeding my expectations for a stock street car. From factory, the GR Supra is well-manned on the street and well-balanced on the track, making the transition from street to track seam effortless,” says Barber.

The “86,” the longest running member of the current One Lap fleet, was fielded by the PE Motorsports team during their second attempt at One Lap of America in 2016. It has run every year with the exception of last year during the COVID-19 shutdown.

This vehicle has been instrumental as a test rig for the development of custom data acquisition (DAQ) tools that have been adopted by the rest of the fleet. This data has been extensively analyzed over the years to fine tune suspension, powertrain, and aero setups to maximize on-track performance. The “86” placed 5th in class, out of 45 overall, and will soon be “retired” to become a track day training car for new members.

Building Better Vehicles



The engineers use the race to gain insight on potential tweaks that can make for better performing vehicles.

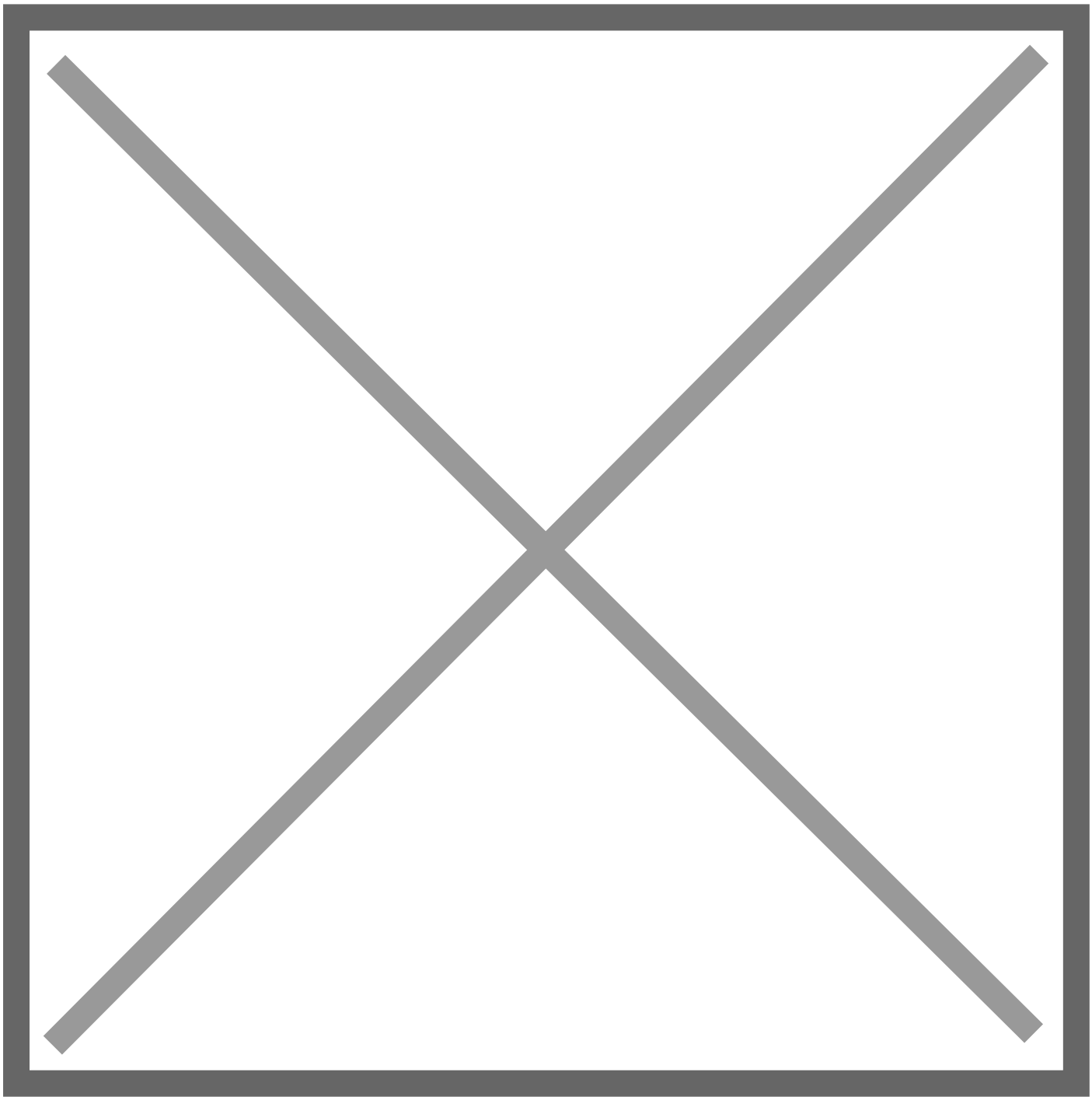
In the spirit of continuous improvement, the team drafted up a list of reflections and planned countermeasures immediately after One Lap to improve performance for next year and is currently working through those items as they prepare for the 2022 competition.

“One thing that I am really proud of is the collaborative approach our team has to drive continuous improvement,” said Justin LaChausse, production engineer and PE Motorsports team lead. “We are all

engineers, but we don’t race every day, so we really have to rely on the diverse backgrounds and skillsets of our entire team and our internal and external partners to help us succeed on track. Through this approach, our team members expand their knowledge base in aspects that not only help the team, but also help them to become better engineers in their daily jobs”

But gauging potential improvements to future models is not the only benefit of participating in motorsports-type activities. The arduous, weeklong trek provides ample opportunities for the team to put into practice key Toyota values of teamwork and respect for people, as well as a rare opportunity for the engineers to engage directly with the community on the vehicles they help produce.

“I’ve gained a lot of appreciation for what I do in my daily engineering because I get to race and drive these cars for Toyota,” says Brownfield. “It helps me in my day-to-day job, and definitely improves my morale after returning to normal work.”



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Learn more about One Lap of America HERE