VOLUME 36, NUMBER 10 OCTOBER 2021

PRI

PERFORMANCE RACING INDUSTRY MAGAZINE







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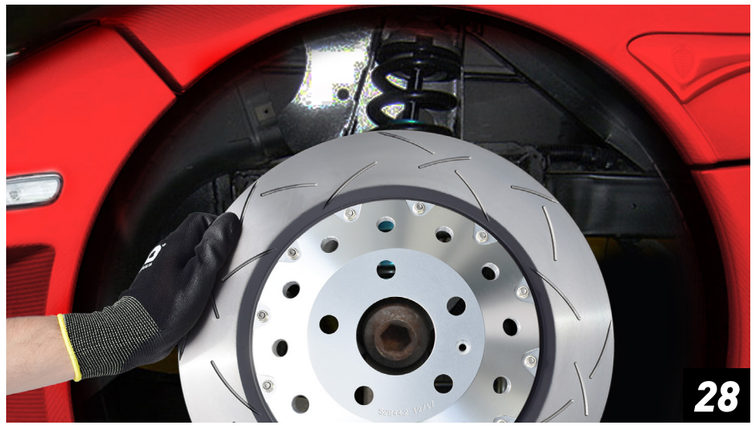

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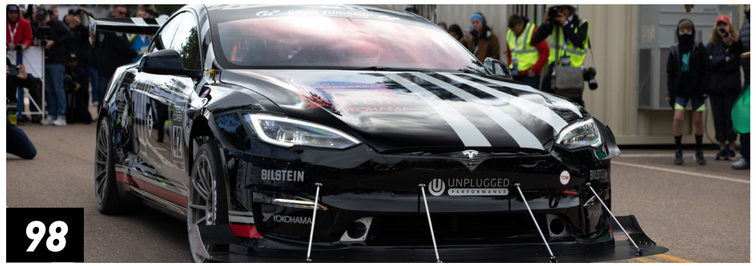

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ON THE COVER
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FROM THE PRESIDENT

The PRI Road Tour's recent stop at the largest tractor pull in the world—the incomparable Pull Town USA event in Bowling Green, Ohio, brought to you by the National Tractor Pullers Association—left an indelible impact on the PRI Team and me. Part state fair, part Mardi Gras, part family reunion, and all about motorsports—the more than 500 tractor pullers that populate this event put on a show at a level that is rarely seen in a sportsman event.

None of this will take you by surprise if you are even remotely tuned in to our social media channels. PRI hit this event with almost every creative staffer that we have in our bullpen, and you were rewarded with some of the wildest action our community has ever seen. To see these lumbering giant tractors resting at the PRI Show is one thing, but to see all 35,000 horsepower straining in anger in front of a crowd of over 80,000 fans, well, that's something quite different.



PRI President Dr. Jamie Meyer, at center, with National Tractor Pulling Championships Media Director Dave Schultz, left, and President Mike Erford, right.

Of course, we are covering this event in great detail here in PRI Magazine, but I wanted to give you my personal takeaways after spending an evening with Mike Erford and Dave Schultz and their team. As soon as we hit the Wood County Fairgrounds, the energy was palpable. As Dave drove us into the venue, we paused for the playing of the National Anthem. It was later that Dave explained that Pull Town usually has the US Air Force do a flyover, but because of military operations, they were unavailable. No problem—a tractor pull team lent their private jet for the ceremonial act of freedom.

The customer service was off the charts. All evening, Dave was pointing out enhancements that had been made over the decades, always with the customer in mind, that added to their enjoyment.

Throughout the event, I couldn't help but be impressed with the flow of the show, the constant entertainment—always something to look at, always something to see. There was major sponsorship involved at Pull Town USA, and the PRI Road Tour team had visited with the good folks at Callies Performance Products earlier in the day. Still, it's clear that a lot of engine parts manufacturers are missing one of the cornerstones of the industry here.

When I got a chance to address the crowd, I thanked them for their passion and love of motorsports, and I invited them to the PRI Trade Show in December. They appreciated the fact that PRI had come to their favorite tractor pull to help share the action and excitement with the world. And I was rewarded with 80,000 new friends.

With a 54-year legacy, Mike and Dave told me, "People are always asking us what the secret is to Pull Town USA."

For me, after just a short visit, the secret was quite clear. Mike, Dave, and all the other "Blue Shirts" (code for volunteer staff) are the secret to Pull Town USA. They love this motorsport, love their pullers, and will do anything to give their audience a show that will keep them coming back for another 50 years.

Long live Pull Town USA, and God bless America!

PFI SPEED VIDEO

To put this very simply: The racing industry is under attack by the Environmental Protection Agency (EPA), and we all need to pay very close attention to what is going on here.

By now, I hope you have taken the time to watch the interview I did with Brent Leivestad, owner of PFI Speed out of Fort Lupton, Colorado. If you haven't, please go to https://youtu.be/lpPgY7S3E2g and check it out. Brent tells the story of how the EPA has fined him $18,000—a sum that if unpaid within 30 days rises to $180,000—for selling Hondata devices (37 units). What should sit you straight up in your seat is that Brent was able to show us documents demonstrating that at least 24 of these sales were to dedicated race cars. Why this is so important is that the EPA has said it wouldn't apply the Clean Air Act to race cars; but this is the first documented case of them going after the sale of race car parts to race cars strictly for the purpose of racing. So, please, watch the video, and share it with your customers and racing network.

To protect our industry and motorsports events like the Pull Town USA tractor pull, PRI has been transformed into an advocacy group (alongside our award-winning media and events). PRI Membership and the supporting 501(C)4 PAC that backs this membership have been developed to protect you, the racing industry professional. As the PRI Membership grows, and we raise money and numbers of voters, our influence in Washington, DC, will grow as well. Together, we will have a better chance to take on the challenges facing the racing industry. Today it is the EPA, tomorrow it will be something else. But, with your PRI Membership we will face it together, as a united team, able to take on anything that comes our way. PRI



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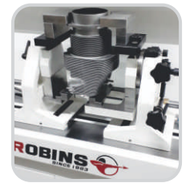

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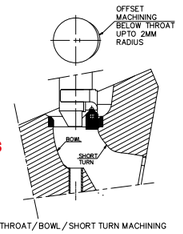

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FROM THE EDITOR



DAN SCHECHNER
dans@performanceracing.com

Here's what I think while tracking the PRI Road Tour's progress this month from Super Dirt Week (Oct. 7–10) to the Indy Autonomous Challenge (Oct. 22–23) to the Dodge/SRT NHRA Nationals (Oct. 29–31).

1) I THINK—NO, I *KNOW*—THAT I couldn't be more excited to share the news that Jim Liaw has just been named General Manager of Performance Racing Industry (PRI). Jim arrived at PRI last month from Formula Drift, the preeminent international drifting series he co-founded with Ryan Sage back in 2003. Truth be told, we've been big admirers of Jim's for years—he and Sage were profiled in our *Industry Insights* column in 2007, followed by Jim alone just a few years ago. I recently went back and re-read that interview (*PRI Magazine*, April 2018) in the context of Jim becoming our new GM and, I have to say, we couldn't have scored a bigger win. The track record at FD speaks for itself, but it was Jim's response to a question on leadership and keeping perspective, in particular, that I thought really spoke to his passion and approach to building successful operations: "I think I go back to something I realized when we started the series in the beginning: I am first and foremost a fan, and that keeps my feet on the ground…. I'm a racing and a car enthusiast; I go to all kinds of events, all kinds of races, as a fan. I always keep that in mind. The way we operate [at Formula Drift] and what we focus on is that our series is not solely about helping your company or your team drive revenue; there has to be a fan element and culture within the series. We want to take the time to create something people can enjoy, and that's been our primary focus." You can read more about Jim's role at PRI in the lead-off to our Industry News section on page 170. Keep an eye out for next month's issue, too, where we'll sit down for a one-on-one with Jim to discuss his thoughts on the present and plans for the future of PRI.

2) I THINK THE LIST OF "PRI FIRSTS" just grew once again with the successful execution of SaveOurRaceCars.com Championship Night at Madison International Speedway (MIS). Yes, the August 20 program in Oregon, Wisconsin, where three track champions were crowned at the NASCAR-sanctioned half-mile paved oval, was the first time PRI has ever sponsored a race. And it couldn't have been for a better cause, as the event provided a perfect opportunity to connect on a grassroots level and raise awareness of the threats facing our industry. Those threats begin with the US Environmental Protection Agency (EPA) and its efforts in recent years to prevent vehicles designed for street use from being converted into dedicated race cars. PRI and SEMA have been working tirelessly to fend off EPA overreach, most notably through introduction of the Recognizing the Protection of Motorsports Act of 2021 (RPM Act), a bipartisan bill that, if passed, would confirm that it is legal to make emissions-related changes to a street vehicle for the purpose of converting it into a race car used exclusively in competition; it also affirms that it is legal to produce, market, and install racing equipment on converted race vehicles. There were several takeaways from the experience at MIS, which you can read about in our full report beginning on page 56. And, if you haven't already done so, please send a letter to your lawmaker in Congress, urging them to support the RPM Act, by visiting SaveOurRaceCars.com. PRI

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MEMBER

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LEAD POSITION

If you've never experienced a tractor pull (also called power pulling), here's how the competition goes down: tractors (and trucks, beginning in the 1970s) in their respective classes pull a set weight loaded onto the drag or sled. Class weight can range from 2,050 lbs. (Modified Mini) to 20,000 lbs. (Super Semi). Distinct divisions are established according to vehicle and engine configurations (e.g., Two-Wheel-Drive Trucks, twin-engine Light Unlimiteds). Then, competitors work to pull the sled as far as possible along the 350-foot track, but with a twist: The load gets "heavier" as the puller makes progress because the weight is transferred from the rear of the drag forward, forcing the sled pan into the ground. The winner is the one who pulls the load the farthest. And that, folks, is what the PRI Road Tour encountered on a recent stop in Bowling Green, Ohio, for the National Tractor Pullers Association (NTPA) National Championships. For more on this and other events from the 2021 Tour, see our coverage beginning on page 64.

PRI MEMBERSHIP:

IT'S ALL ABOUT POWER

Unity in the racing industry has never been more critical than now to ward off government overreach. Here, one motorsports entrepreneur shares his personal fight.

By Rex Roy

This fifth installment of the PRI Members series takes an honest, practical look at why PRI Membership is so important. The short answer is simple: Advocacy. For those not familiar with recent legal actions by the Environmental Protection Agency (EPA) against tuners, retailers and other racing businesses, prepare to have your eyes opened.

"The industry is reeling from the EPA's recent actions," said PRI President Dr. Jamie Meyer. "We're seeing the industry attempt to understand the EPA's enforcement actions. Tuners and component suppliers feel that their businesses are threatened. We've already heard of distributors planning to drop powertrain products because they fear becoming targets of EPA prosecution."

Meyer has previously noted that the diesel tuning market has already been hard hit, and products for traditional race engine builders, such as long-tube headers, have vanished from the market due to EPA enforcement actions.

It's not as if the EPA's actions are clandestine. The agency publishes lists of consent agreements here: epa.gov/enforcement/2021-clean-air-act-vehicle-and-engine-enforcement-case-resolutions.

The page for 2021 includes dozens of companies, many of which are diesel tuning specialists. The EPA-imposed penalties are significant. It's one thing to lose a business for free market reasons, it's another matter to have a business financially crippled or forcibly shut down by bureaucrats.

WHAT IS THE RPM ACT?

While there is a long fight ahead for the performance and racing industry in Washington, DC, the good news is that PRI and SEMA are fighting this battle professionally and respectfully on the legislative front. The effort is personal to many at PRI, and may in fact impact your business, your suppliers or your customers.

If passed, the RPM Act will have a significant, lasting effect. Let's look at the big picture.

The Recognizing the Protection of Motorsports Act of 2021 (RPM Act) is bipartisan legislation that protects Americans' right to convert street vehicles into dedicated race cars. The RPM Act also protects the motorsports-parts industry's ability to sell products that enable racers to compete. The bill clarifies that it is legal to make emissions-related changes to a street vehicle for the purpose of converting it into a race car used exclusively in competition. It also confirms that it is legal to produce, market and install racing equipment.



PFI Speed



Becoming a PRI Member is the first step in supporting the Recognizing the Protection of Motorsports Act of 2021 (RPM Act), a bipartisan bill that protects Americans' right to convert street vehicles into dedicated race cars.

The RPM Act is something every single participant in the business of racing can and should get behind.

THE FIRST STEP

Becoming a PRI Member is the first step to support the RPM Act, which was written to save your business and protect your right to race in the future.

New for 2021, PRI has launched a membership program for individuals and businesses. Joining PRI will make Members part of a like-minded community that will help build, promote and protect motorsports, and quite possibly defend individual people. Membership options begin at just $40, not even the cost of a full tank of gas in today's economy.

The link to PRI's Membership page is performanceracing.com/membership. Signing up is easy, and the community is responding. Thousands of individuals as well as hundreds of businesses have joined. In addition to the four Founding Members featured in this story, 21 additional companies signed on for the Founding Members' $25,000 10-year commitment.

Here's why these companies have made such a major investment: Every PRI Founding Member has put their faith in the PRI Government Affairs group to lobby the appropriate legislators with the most effective messages to counter the EPA's enforcement policies with a new law.

The Founding Members trust PRI to communicate their support of PRI's Save Our Racecars campaign and the RPM Act of 2021. PRI Founding Members know that when our entire industry wins battles against regulation, our entire industry benefits. In other words, they're doing it for their own businesses, and for your right to race.

PRI MEMBERSHIP LEVELS

Pro Member: $40

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- Inclusion in the Performance Racing Industry Political Action Committee
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- Subscription to the PRI eNewsletter
- Posting access on the PRI Jobs Board
- PRI Show Exclusive Benefits
- Pro Member Show Badge/Identification
- Early Access to the PRI Trade Show Floor

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The most popular membership level is less expensive than just about any tool in a box, but becoming a PRI Pro Member does more than any wrench or screwdriver. A PRI Pro Member supports the industry that supports you, your business and your family, at just $40 per year.

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The ultimate commitment to the PRI community goes to those who become Founding Members. Unlike the other memberships that are paid annually, Founding Members make a 10-year commitment. The total outlay is $25,000, a sum that's absolutely reasonable when paid yearly.

Additional and updated membership information is available on the PRI website at performanceracing.com/membership, and the PRI team is available to answer any membership questions.

FROM THE FRONT LINES

Many believe the EPA's enforcement actions are limited to gross environmental polluters or huge automotive companies like Ford, Volkswagen or heavy equipment manufacturer Caterpillar. Yet the EPA now has years of enforcement actions against small businesses that service niche racing markets. Here is one shop's story.

The team at PFI Speed, led by Brent Leivestad, started in the performance and racing hobby by scrounging for Honda and Acura parts at junkyards back in the mid-1990s. Through decades of hard work and ingenuity, Leivestad built a viable business that serves the drag racing market from a

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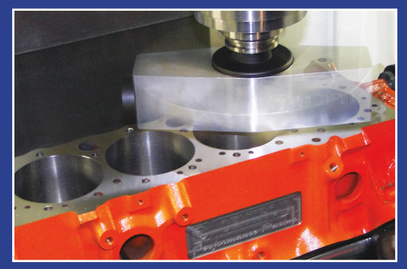

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PRI President Dr. Jamie Meyer, at left, meets with Brent Leivestad, whose Colorado-based performance shop was recently targeted and fined by the US Environmental Protection Agency over alleged violation of the Clean Air Act.

7,600-square-foot, 11-bay shop in Fort Lupton, Colorado (northeast of Denver). The company's YouTube channel is popular (334,000 subscribers), and its team (that includes Leivestad family members) occupies an important niche in amateur and professional drag racing, selling race parts and offering dyno tuning.

In November 2020, the EPA contacted Leivestad demanding information on the company's products, its suppliers and customers. The letter was the first step in an official audit of PFI Speed.

PFI Speed complied and provided the information. Leivestad said, "We gave them all our stuff, and it was like, this is us. They gave us an extension because it was a lot to go through." Months later, the EPA found PFI Speed in violation of the Clean Air Act and levied an $18,041 fine.

Leivestad was understandably angry, yet in every interview and YouTube post, he has remained admirably calm, respectful and professional. While Leivestad's attorney recommended he sign the agreement and pay the discounted fine (down from $180,000), Leivestad hesitated. "If I sign this document, I, Brent Leivestad, can never modify a car again, or they can come back at me."

PFI Speed's situation is not enviable. He has decided not to settle.

"The EPA is taking the position that any car that has a VIN can't be modified, and it doesn't matter whether you tow it to a track or not," Leivestad said. This interpretation essentially makes preparing vehicles for many of the most popular forms of amateur and professional racing illegal. Engine transplants are also illegal if the engine came from a production vehicle.

The racing industry needs the RPM Act to become law in order to legally prevent EPA enforcement action from fining and potentially shutting down more companies like PFI Speed.

Accurately charactering the situation, Leivestad said, "This is not just about us, this is about the industry. I feel like if I say that I was in the wrong, then what's to protect you [others in the industry]? I don't believe I did anything wrong. It's going to take everyone coming together."

THIS CASE IS FAR FROM CLOSED

If the RPM Act doesn't become law, PFI Speed's story could become your story, or the story of the shop that builds your cars or the retailer that sells you parts. Leivestad's story exemplifies the importance of becoming a PRI Member. Now. Every level of PRI Membership remains open, but PRI Founding Member Status is only available for limited time.

Regardless of which membership option you choose, PRI can't protect our industry without your help. Your membership might mean the difference between our industry winning or losing the fight in Washington, DC.

PERFORMANCE AUTOMATIC



The performance and racing industry is full of niches where expert specialists offer their skills to customers looking for that last nth of performance. This is how Performance Automatic in Frederick, Maryland, got into the business more than 35 years ago. Owner Rich Carlton said, "During the heyday of the 5.0 Mustangs, we focused on developing racing products for Ford automatic transmissions." The company expanded to offer products for traditional three-speed GM Hydramatic and Chrysler TorqueFlite products, and now offers an impressive catalog of products.

The company's Street Smart line of transmission packages carries a lifetime warranty, and higher capacity four- and six-speed transmissions are now available. "We're continuing to support and develop new products for drag racing, muscle cars, street cars and even kit cars," Carlton told PRI.

"Performance Automatic is honored to be a PRI Founding Member," he said. "We have all faced numerous challenges in the last 18 months, but we are looking to the horizon where we can reach new goals working together. Being a Founding Member will help us do our part. We will grow with our industry while supporting all levels of motorsports, attracting younger customers, generating fresh ideas, and hopefully enjoy another 35 years of success."

DRP™ Performance Products



Now a worldwide supplier of hub components and chassis setup equipment, DRP Performance comes from humble roots. Back in the 1980s, DRP began as a small supplier of racing parts to local circle track racers. The Rocky Mount, Virginia-based team now designs and manufactures original products for professional and semi-professional race teams and chassis builders around the world. "Our team innovates, and that's made us an industry leader in our field," said Lynnie Doughton, DRP Performance president.

The company's bearing kits, seals and grease are used by championship teams across racing's spectrum, from karts to NASCAR. DRP's advanced chassis setup equipment, including pull-down fixtures, alignment systems and data acquisition systems, enables race teams to learn faster, with fewer mistakes and less wasted money.

"Our team's goal is to simplify the most complicated parts of being competitive so that more people can be involved in racing," Doughton said. "Our products help shorten learning curves and reduce the investment in trial and error.

"DRP Performance recognizes that our industry needs an organization out there promoting the benefits of what we do to the rest of the country and world," he continued. "PRI fills this role well. When PRI offered the Founding Member program, it was an easy decision for us. We love the racing industry and want to support it in any way we can."



F&S Collision Repair Center Inc. is a husband-and-wife owned shop formed in 2002. The business now occupies 11,000 square feet in Troy, Missouri (northwest of St. Louis) and specializes in high-quality collision work. The company's motto is, "If you can tell we fixed your car when you get it back, we haven't done our job."

Chris Fetter's pride in his work, his company, his family and his community is evident. F&S supports multiple community organizations including the local Rotary International and the Chamber of Commerce. Fetter and wife Shan's two youngest sons, Brandon and Derek, work in the family business. The boys learned the trade when they were young and built cars that won at local car shows and the NOPI Nationals. One of the boys' creations even landed a cameo in a Honda commercial.

F&S works diligently to put just about any vehicle back on the road. The company's services range from paintless dent repair to fixing vehicles involved in major collisions. The company also has the capabilities and room to complete repairs on motor homes, over-the-road trucks, and its home county's emergency vehicles, ambulances and fire trucks.

The Fetter family has always been involved in racing. Chris currently races against Derek in the dirt late model division. Chris said he became a Founding Member "because I've been a spectator, sponsor, mechanic, engine builder, fabricator, car owner and driver. I have been on every side of the fence, so I have experienced just about everything someone could in motorsports. I want a say in the way the motorsports industry moves forward so that racing can be affordable, and that we have a level playing field that's exciting for spectators to enjoy."



Founded in 1993, QA1 is now an industry leader in performance shocks, suspension components, composite driveshafts, rod ends, spherical bearings and related accessories. The company has remained a dedicated member of the motorsports community since its inception. Some of QA1's first products were circle track shocks and related components.

QA1 has since expanded its expertise to include shocks and fabricated components for street performance, pro touring and drag racing enthusiasts. This includes everything from individual components, such as tubular control arms, K members and trailing arms, to full-vehicle suspension systems.

The company operates out of its office and 100,000-square-foot manufacturing space in Lakeville, Minnesota. The state-of-the-art facility includes a complete line of CNC machines, hydraulic presses, filament winding and laser cutting equipment that permit all-inclusive shock absorber, suspension component and composite driveshaft manufacturing and assembly operations. QA1's quality system is certified to the ISO 9001 standard.

Melissa Scoles, president/CEO, at QA1 told PRI, "Many different forms of racing have made up the core of our business for decades. Many QA1 team members spend their time in the garage getting ready for race day or bringing their family to events to pass along the tradition to new generations of enthusiasts. Committing QA1 to become a Founding Member made sense to me both on a business and personal level." PRI

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RACE TEAM CONFIDENTIAL

SWOOP MOTORSPORTS—SUMMER RICHARDSON

SANTA CLARITA, CALIFORNIA

After setting speed records on water, this racer faced a whole new learning curve when she turned her attention to Super Comp and Top Dragster racing on dry land.



I started my racing career on the water with performance boats in 1-mile shootout events at Lake Havasu and Lake of the Ozarks. I have multiple records for fastest solo female powerboat driver on water, setting a world record in 2016 with a top speed of 185 mph in a 388 Skater powerboat.

After racing in shootouts for five years, the sport was becoming too dangerous, and we were seeing more boating accidents. I wanted to continue my racing career, so I turned to drag racing with my husband, Travis Richardson, and father, Don London, joining me.

It just so happened that Top Fuel driver Shawn Langdon's dad, Chad Langdon, was selling his entire Super Comp operation. We went down to their shop, and it turned out to be a perfect fit.

Swoop Motorsports is our race team, and we have five cars in the fleet, racing in Super Comp and Top Dragster classes. My dad has been an engine builder for years, so he built all the engines for our team.

With the first dragster I raced, we modified the car just for me at London Racing Engines (my dad's shop). We decided to go through the car from front to back to learn everything we needed to know about the driveline and give it a complete refresh. We updated the dash to Racepak, re-wired the entire car, adjusted pedal location and cables, gave it a new paint job, got a custom seat made to fit me, added a new windshield, got a new engine build from London Racing Engines, re-certified the chassis and so much more. We truly made it custom to fit me.

For the 2021 season, we recently raced at Pomona for the first time. We didn't have any data on the cars, and track temps were hot, so let's just say that was a learning experience for us. However, I was able to go two rounds in Top Dragster and Super Comp.

Other events we plan to attend this year are the Divisionals in Boise, Idaho, in September (at press time), then the Vegas Divisionals, followed by the Vegas Nationals and the World Finals in Pomona. This has been a very tough year, as a lot of the races got cancelled in the beginning of 2021 due to COVID-19. They were re-scheduled at the end of the year, so we had to pick and choose what we could attend.

Prepping the race cars before events usually consists of oil changes, new spark plugs, and inspections of frames, brakes, chutes, tires and electronics. Additionally, when we arrive at the track, the weather stations go up and we start monitoring the weather, especially the DA [density altitude].

In sportsman Super Comp racing, we have learned that once you get your car running great, don't touch it. To hit your index, you have to do the same routine every time: same air psi, same dead stall, same launch rpm. We do minor changes depending on altitude, but for the most part we try not to touch them.

As for Top Dragster, we change out spark plugs every one to two runs depending if we are testing the car for heat index within the cylinders (timing mark on the plug). Then we add more fuel per gear, we check tire shake if there is any, and possibly then change launch rpm if need be.

After each run, we record all of our times and mph and input it into the Crew Chief software. We have it so dialed now that if we know what our 60-foot is, we can usually get very close to the number. The Super Comp dragsters also have Racepak to monitor all the engine data like dead stall rpm, launch rpm, engine temperature, driveshaft rpm, etc. This really helps us make sure the cars are running consistently each time. The last few years we have been collecting data at the tracks, and now it's starting to pay off as we know what to dial coming into our first round of qualifying. It really helps us get on the number faster, then we must rely on ourselves to cut a light.

Top Dragsters are equipped with ComSync electronic fuel injection/ignition systems. This is where we collect the performance data to make any changes for the next run. We also collect data from the AFR readings, EGTs and inlet air temperature to make adjustments where they are needed.

Regarding how often we replace parts, the Super Comp dragsters are 614-cubic-inch engines that receive new valve springs, lifters, rod bolts, pistons and pushrods every two years. We adjust/check the valvetrain every two races and do frame inspection and change the spark plugs and oil every three races.

The Top Dragster engines require a little more attention as they are making upwards of 2,200 horsepower on methanol. General maintenance includes checking transmission fluid for quality, inspecting the entire frame on rail for any cracking, checking the CV joints in the driveline, performing a leakdown and compression tests. We also check the valvetrain and keep track of the number of runs for connecting rod change-out and lifters.

To wrap it up, in 2017 I went to Frank Hawley's Drag Racing School and got licensed in Super Gas and Super Comp. In 2019, I received my Top Dragster license from Tom Bayer's School of Drag Racing. Next on my to-do list: Top Fuel! PRI



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ASK THE EXPERTS

PARTS CLEANING

Selecting the right equipment—and using it correctly—will help users avoid common mistakes and achieve optimal results.

By Drew Hardin

Clean parts are important to ensure any sort of automotive assembly works properly. The high-stress environment of racing steps up that need considerably, to a point where the parts need to be "precision clean," a term coined by the team at UltraSonic LLC of Amelia, Ohio. Yet there can be a disconnect between the desire for clean parts and the steps to get them there, despite the wide variety of cleaning machines and processes available to race shops and teams.

"One machine doesn't do it all," observed UltraSonic's Phil Esz, who races a Top Alcohol Funny Car. "You need an arsenal of cleaning equipment."

Dave Ward of ABS Products, Brea, California, agreed, adding, "The number-one issue we run into is using a machine not for the purpose it was intended for, or not using the proper machine for the proper results."

Here, Esz, Ward, and other parts cleaning experts share their views about the different methods of cleaning and mistakes to avoid during the process.

THE RIGHT TOOL

"Knowing the desired outcome is the key to getting the right machine," said Ward. As an example, he compared cabinets: "If someone is looking for more of a factory look to cover up machining marks, that requires a blast cabinet with a heavier type of abrasive, such as steel grit or shot. That finish isn't possible with a cleaning type of cabinet and media like soda or glass bead, which are more on the mild side."

In some cases, he pointed out, "two machines may be needed. The job could start with an ultrasonic cleaning machine and finish with our HydroSlurry machine to create a clean, new-looking part. Or, for a crankshaft, a blast machine can be used to clean the crank, which then gets polished on a polishing lathe."



Effectively cleaning race components requires the proper equipment. Winona Van Norman recommends using its Thermal Cleaning Systems, which incorporates a three-part process that bakes off the grease and grime with its Eliminator Oven (seen here), followed by a shot blaster that blasts the ash and contaminants off the surface, and concluding with a shaker that removes the blast media.

Cleaning materials are just as important as the equipment that houses them. In fact, problems often occur in shops where the media has been overlooked and wasn't replaced in a timely manner. "It's not doing the job it was originally meant to do," said a source from Giant Finishing.



Ultrasonic machines "really shine in the racing community because the parts are pretty clean to start with," Esz explained. "It cleans the oil, grit, and dirt off in a matter of seconds."

"With really dirty stuff, guys get good results using their spray cabinets and soda blasters in conjunction with an ultrasonic cleaner," added UltraSonic's Jason Shaw. "They can cut down on cleaning times with other equipment, and then use the ultrasonic cleaner for final clean before assembly."

"The main question we ask the customer is, 'Tell me about your project,'" said Mark Oryszczak of Giant Finishing, Addison, Illinois, which specializes in vibratory deburring and finishing machines. "After vibratory finishing, what is the next step in your manufacturing process? Is this final finish? Does it go to plating? Does it get painted? Are you looking to polish? Does it go to assembly? Does it get welded? What is the size of the largest part you envision putting into the machine? Those questions help us determine what type of process to give them."

"The most difficult problem to clean is grease, especially grease that has been baked onto hot surfaces and collected other grime from the atmosphere," said Lisa Hargrove of Winona Van Norman, Wichita, Kansas. "The most effective way to address this problem is with one of our Thermal Cleaning Systems. The three-part process bakes off the grease and grime, then blasts the ash and contaminants off the surface. Then a shaker removes the blast media and cools down the part for handling."

"KNOWING THE DESIRED OUTCOME IS THE KEY TO GETTING THE RIGHT MACHINE."

"WE'RE CREATING NEW MEDIA ALL THE TIME, COMING UP WITH NEW SHAPES FOR CERTAIN ISSUES."

THE WRONG WAY

The most common mistakes Hargrove sees with Thermal Cleaning Systems occur when an operator "assumes this can be done in just one process. Problems arise from skipping steps. You can't go straight to blast or only bake if you expect to have a truly clean part."

"One of the things people do wrong with an ultrasonic machine is put too many parts in," Esz said. "They think they can fill the thing up like a hot tank. But when there's a lot of weight in the tank, it sucks up all the ultrasonic power, and it's not very effective."

Operators also have the tendency to start the cleaning process before the water-based solution in the ultrasonic tank is up to proper temperature, Esz added. "It cleans better at the correct temperature—150 degrees—than it does at 100 or 110."

Cleaning materials are often overlooked—and overworked—say our experts. "You have to keep that media clean," said Oryszczak. "A lot of problems the guys have with the media come from the fact that they've had the same media for decades and it's all glazed over. It's not doing the job it was originally meant to do. Finding the right chemistry is also extremely important."

Also, operators often "don't have enough media in the machine, and they're not getting the proper tumbling action," he added. "When there's more media in the machine, and the parts go down to the bottom of the machine, that's when the work is getting done, when you have all that weight pushing down and grinding. If the parts are just sitting there vibrating on top, nothing's getting done."

Media selection has a big impact on the cleaning results as well and is "the biggest thing most people need to learn," said Oryszczak. "There's literally thousands of different combinations of sizes, shapes, and compositions of media. We're creating new media all the time, coming up with new shapes for certain issues." For example, media has been developed especially for gears, "to get into the valleys in between the teeth to make sure it gets cleaned. If you just put a general-purpose medium in it, it might be too big and won't reach certain areas."

THE BEST THING

All of our experts encouraged engine builders or race teams to reach out with any questions they may have about parts cleaning.

"Pick up the phone and call us," said Oryszczak. "I can get more out of a phone conversation than an email or text. You might divulge something you didn't think is relevant that could have a huge effect on what I tell you to do." He also invites customers to send sample parts. "Let us process them for you and get the results. We can potentially show you much better results more efficiently than what you're doing now. Then you can come in and run sample parts with us in our lab."

"When looking at any type of machine, especially one you're spending big dollars for, you really should talk to people who know what they're talking about within the industry, whether it's the company you're buying from or experts in that field," said Ward. "Ask them what they're using and how they're using it. They won't tell you their secrets about how they're making their engines last longer or produce more horsepower, but they more than likely will talk to you about their cleaning equipment and how they use it." PRI

SOURCES

ABS Products
abs-products.com

Giant Finishing Inc.
giantfinishing.com

UltraSonic LLC
ultrasonicllc.com

Winona Van Norman
winonavannorman.com



TECH UPDATE

ROTORS FOR TRACK DAYS

Accounting for heat capacity and thermal stress management, here's how to select brake components that correspond with different driving styles.

By Brian Johns

Choosing the correct disc brake setup for a fun day at the track can be confusing and expensive if you use a product that is not fit for the purpose.

The two most important factors when it comes to disc brake rotors used in extreme applications such as motorsports is heat capacity and thermal stress management.

Heat-capacity design is a compromise between having enough metal mass in the friction ring to accept and process the kinetic energy transferred into the brake system to decelerate the vehicle and trying to minimize the rotating mass of the wheel assembly (which is unsprung weight).

Thermal stress management is all about minimizing fatigue to prolong the life of the disc rotor. Regardless of the manufacturer or disc design, gray cast iron will fatigue in motorsports applications. The thermal expansion from heating and contraction when cooling initiates a stress-and-strain cycle that is essentially metal fatigue.

It is common practice for professional race teams to discard the disc rotors after a known period, whether it be a certain number of laps or hours in race conditions, to avoid any unpredicted failures due to metal fatigue.

ROTOR SELECTION

There are several types of rotors used in motorsports. Some drivers like to maintain the factory setup with plain discs, and this is okay. This choice does require more scrutiny in friction material selection to avoid surface glazing and declining friction performance.

Many brake companies offer disc rotors with slots in them. The purpose of the slots is to evacuate waste material (dust and gas) from the friction surfaces. The slots will ensure consistent friction performance throughout the life of the disc and pad.

This leaves us with drilled or drilled and slotted discs.

Drilled disc rotors are not recommended for track use of any kind. The drilled holes are focus points where stress and fatigue will accelerate and eventually result in crack formation. Drilled disc rotors have proven to improve braking performance on the street, where normal driving conditions rarely exceed 500 degrees F and stress is not a concern.

In summary, we feel the best choice is slotted rotors wherever possible. All of Disc Brakes Australia's disc rotors are available in various surface configurations, including slotted.



Disc Brakes Australia (DBA) manufactures disc rotors with slots, which are designed to evacuate waste material, such as dust and gas, from the friction surfaces. The slots allow for consistent friction performance throughout the life of the disc and pad, according to a company source.



DBA's 4000 Series and 5000 Series (seen here) disc rotors undergo a thermal stress cycling procedure during the manufacturing process to ensure the metal structure is set for optimal performance out of the box.

POST-PRODUCTION TREATMENTS

There are several post-production treatments or processes applied to disc rotors marketed in the industry, including heat treatment and vibrational stress relieving. Cryogenics is another method of treating the discs post manufacturing. The discs are often sourced direct from an external or unknown manufacturer and processed later by the distributor, who may not have detailed knowledge of the disc rotor's material properties. The risk of not receiving the desired performance is real.

DBA's 4000 Series and 5000 Series disc rotors undergo a thermal stress cycling procedure during the manufacturing process to ensure the metal structure is at its optimum for maximum performance out of the box.

FRICTION MATERIALS (BRAKE PADS)

There are hundreds of different friction materials available for road and track vehicles. Material choice is a personal one, as driving styles differ with confidence and experience.

It is important to cover some basics when it comes to making the best choice. Many OE friction materials are designed for comfort and moderate performance in normal street applications. Often these are Non-Asbestos Organic (NAO) class pads that are gentle on the rotors and make little noise. These pads are not intended for prolonged high-temperature applications.

Sintered metal, carbon metallic and semi-metallic pads, as the names suggest, have varying amounts of metal as part of the compound. These pad materials offer a high-friction coefficient and higher temperature resistance. Each of these pads has different performance characteristics, so it pays to do your research.

FINAL CONSIDERATIONS

Here are some key friction material metrics to focus on:

Initial bite: The friction coefficient upon the first application.

Peak effectiveness: The point where the material reaches its highest performance. Usually related to temperature.

Release speed: Responsiveness when releasing the pedal.

Modulation: A technique of applying and releasing the brake pedal to effectively decelerate while maintaining maximum control and applying the least amount of stress in the brake system.

Wear: Wear and tear are critical for product life and cost effectiveness.

Below are friction material characteristics to consider:

Super Sprints: High initial bite with a peak effectiveness at temperatures of 200 degrees F to 300 degrees F. This may support a late-braking driving style for short sprints.

Circuit racing 10–15 laps: Moderate initial bite increasing to a peak effectiveness at 550 degrees F to 750 degrees F. This may provide the most effective brake and tire friction at the same time, typically lap number three or four, for strategic, competitive driving.

Endurance: Moderate initial bite with a very flat peak effectiveness curve from 550 degrees F to 900 degrees F. Typically slightly lower coefficient of friction than the above race pads to ensure longer pad and rotor life.

Please note: Each person's driving style is different, and it is the responsibility of the driver to determine which braking products are best suited to their driving behavior. The above information is a guide only to assist the driver in conducting their own research. PRI

Brian Johns is currently Head of Innovation and R&D for DBA. He has spent more than 15 years in various automotive roles across the globe for many of the major OE manufacturers. He also has 20 years of experience in designing and engineering products for defense and high-tech applications, as well as in the consumer sphere.



PROBLEM SOLVERS

REMOTE TRAINING

When in-person instruction was placed on hold, this welding equipment supplier transitioned to static online presentations, followed by interactive sessions that offer a more effective experience.

By David Bellm

THE PROBLEM: How to bridge the gap between in-person and remote training.

THE SOLUTION: Reformatted class structures and better use of technology.

When welding equipment manufacturer Miller Electric in Appleton, Wisconsin, was forced to stop its in-person training programs at the height of the pandemic-caused lockdown in 2020, it developed innovative new ways to engage and interact with participants in remote-learning sessions.

Miller Electric has an extensive training department, primarily for service technicians and distributor salespeople. Although the classes aren't intended to teach actual welding skills, they're highly technical, with the aim of educating their audience on essential principles of welding and welding equipment.

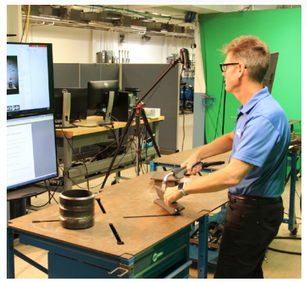
Before the pandemic, 80%–90% of the company's training was face-to-face. Once the pandemic got into full swing, however, that quickly changed. Miller had to immediately adapt to a new world in which all training was remote.

To meet the increased demand for remote instruction, Miller set up training studios in Georgia, Texas, and Ohio, along with three studios at the company's headquarters in Wisconsin. They primarily use Zoom for training sessions unless a client requires a different platform.

But as the remote training programs ramped up, the team discovered shortcomings in how they interacted with online students. One of the first shifts made was to change the format of classes.

"We were mostly doing webinars when the whole stay-at-home order came more than a year ago," explained John Luck at Miller Electric. "It was PowerPoint training. Later in the year, say around September, we started getting into what we call virtual instructor-led courses. Instead of watching somebody do a slide presentation, they're seeing a live instructor talk to them. It's a much more interactive way of doing things."

At the same time, the Miller team improved the technical aspects of their courses to better demonstrate what's being taught. Much of this revolved around finding the right camera and microphone setup to bring students the full sensory experience of proper welding techniques.



"It's a lot more interesting when you can see what's going on as something is being welded, versus just a bright light," said Luck. "But it takes a lot of experimenting—putting a welding lens on a camera, and then getting the right shutter speeds, because there's a frequency that the arc is running at. We also wanted to give people on the other end some sense of what it sounds like. That's been a little challenging for us with microphones and noise-cancelling equipment."

For repair and technician training, the Miller team implemented a unique system that allows instructors to see in real time if the student is performing tasks correctly. Students in these training sessions wear a harness on their chest that holds a camera aimed at the working area in front of them. The camera then interfaces with a computer to send video in real time to the instructor for immediate observation and critique.

"When we ask a student or technician to show us how to repair something, we can see exactly where their hands are going, what they're touching or what they're probing," said Luck.

Making all of these changes proved to be challenging at times, but it was well within the grasp of the company's training staff. "The instructors have a lot of things going on now," said Luck. "There are various cameras that they're toggling from one view to the next, collateral that pops up on the screen, poll questions and results, and additional information for students. But everybody has adapted very well to it."

As the pandemic has eased, demand for Miller's remote learning programs has dropped somewhat, with many people eager to get back to in-person learning. Nonetheless, Luck feels that remote training will always have a place in the company as a vital component in its overall toolbox of training methods.

"We think this is going to stick," said Luck. "We're continuing to invest in our virtual studios. We're looking to add more capabilities as far as better quality, better lighting, better everything to improve that." PRI

Remote training has earned its place as a vital component in Miller Electric's overall toolbox of training methods. "We're continuing to invest in our virtual studios," noted a company source. "We're looking to add more capabilities as far as better quality, better lighting, better everything to improve that."



Forced to suspend in-person training programs last year due to the pandemic, Miller Electric transitioned to remote-learning sessions where virtual instructor-led courses provided interaction among participants.

SOURCE

Miller Electric
millerwelds.com





EDITORS' CHOICE

Hundreds of new product announcements cross the desks of PRI editors each month. Following are our top picks for October.

TERMINATOR X HIGH-IMPEDANCE 220 LB./HR. INJECTORS

HOLLEY PERFORMANCE PRODUCTS

holley.com

Holley Performance Products has just released an affordable high-impedance fuel injector with a 220 lb./hr. flow rating.

"With the wide range of injector sizes in the Holley Terminator X line, these are the perfect upgrade for enthusiasts who are making more power than stock, are adding forced induction or a dry nitrous shot, and are utilizing an ECU that requires a high-impedance injector," said Evan Perkins.

The injectors are compatible with Holley's Terminator X, HP and Dominator ECUs as well as aftermarket and OEM ECUs that have saturated drivers. These PICO/EV6 performance injectors are sold individually or as a set of eight. They come with USCAR connectors and a 40-mm O-ring-to-O-ring length. That makes them compatible with many OEM LS intake manifolds, and they're easy to install in a Holley EFI Hi-Ram intake using the 300–230 fuel rail adapter kit. For extreme horsepower applications, the injectors are also methanol compatible.

Featuring a precision-lapped disc valve, brass windings and high-temperature O-rings, the Terminator X injectors provide excellent linearity with no discernible bounce at low pulse widths.

"The downside of an injector that is oversized for an application is poor fuel control at low pulse width conditions," noted Perkins. "This is called 'bounce,' and it is something we have worked hard to eliminate on some of our larger injectors to give enthusiasts more room to grow their engine combinations." *—Mike Magda*



PTS-2W WI-FI NOTIFICATION ALARM

TRAILER ALARMS

trailer-alarms.com

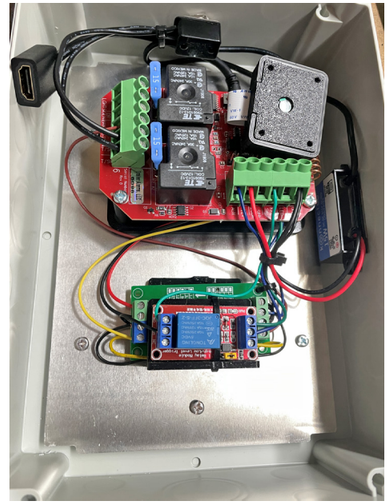
Trailer Alarms can now connect its highly regarded PTS-2 alarm system to a trailer's existing Wi-Fi system, thereby saving the owner additional fees that other notification options would charge.

"It will still send the owner a text alert or email," said Lyle Clark of the New Braunfels, Texas, company, who added that a customer came to him requesting the setup, but it had never been done before. "The biggest challenge was finding a communication device that would connect between our alarm and the Wi-Fi."

Clark's strategy was to use a Raspberry Pi—a mini computer popular with all types of creative projects—as the middleman between the alarm and Wi-Fi. It took literally a worldwide search to find a programmer willing to develop the language that all three components would understand. Following seven months of development and testing, a working unit called the PTS-2W was launched.

A suitable mounting box for all components was found, then the mounts were custom designed and manufactured with a 3D printer. The system still needs to be programmed with the Wi-Fi SSID and contact information for those receiving the alerts.

"The nice thing about the Raspberry Pi is that when the alarm goes off, it will record about 15–20 seconds of video and send that to the owner," said Clark. "That way they have video evidence or can see if it's a false alarm." *—Mike Magda*



CNC-PORTED IRON CYLINDER HEADS

WORLD PRODUCTS

worldproducts.net

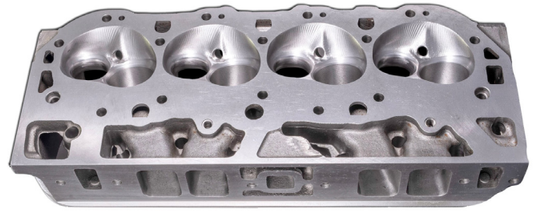
Iron cylinder heads will always have a place in motorsports, whether the choice is driven by sanctioning body rules, budget constraints or durability requirements. With the release of CNC-ported iron heads for the big and small block Chevrolet from World Products, the same airflow technology that goes into popular aluminum heads is now available to racers.

"These are mostly circle track and pulling applications," noted Jack McInnis. "Obviously, they're not limited to those. Offshore marine is also a good place for them because salt water can play havoc on aluminum."

For the big block, Merlin heads are available with 340cc or 365cc intake runners. The smaller offering has a 123cc combustion chamber, while the larger runners flow into a 128cc chamber. Both heads support 2.300/1.880 valves. Airflow numbers for the intake side posted by World show 403 cfm at .800-inch lift on the Merlin 340 and 428 cfm at .900-inch lift on the Merlin 365.

On the small block side, the Sportsman II head features 215cc intake runners and 2.020/1.600 valve sizes. The Motown head comes with 230cc intake runners and a 2.100/1.600 valve package. Both heads have 69cc combustion chambers. On the flow bench, the Sportsman II 215 recorded 289 cfm at .700-inch lift, while the Motown 230 head came in at 318 cfm with .700-inch lift.

World Products partnered with High Velocity Heads to design the ports and manage the CNC operations. *—Mike Magda*

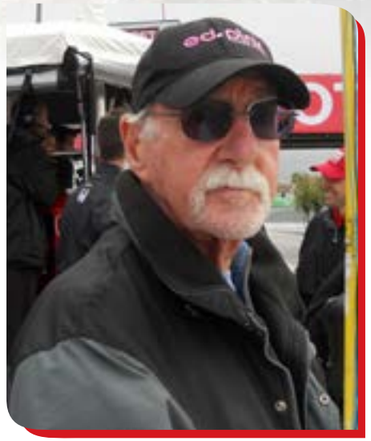


MAKE THE CASE

ICE VS. ELECTRIC MOTORS

As OEMs continue to invest billions in electric vehicle tech, EV powertrains are becoming a growing presence across various motorsports disciplines. This developing technology has compelling advantages, but where do internal combustion engines still have the upper hand? Our advocates weigh in on the inherent strengths and weakness of each method of propulsion in the context of racing.

As told to Bradley Iger



INTERNAL COMBUSTION ENGINES ADVOCATE:
Ed Pink,
Ed Pink's Garage

"THE FANS NEED THE NOISE. THEY LIKE THE SOUND OF THE ENGINES, AND WITHOUT IT, YOU'D SEE INTEREST DROP OFF SIGNIFICANTLY."

There are a number of different motorsport disciplines where internal combustion engines work very well and EV technology, as it stands today, just isn't suitable for the format. How would an EV run in an endurance-style road racing event? Even the most advanced EV powertrains that are currently available struggle to deliver their maximum output for more than a few moments at a time. What about recharging the batteries? We still don't have battery technology that would make sense in longer racing formats, let alone those that require mid-race refueling.

We also need to think about the emotional elements of racing and how they affect the fans. The fans need the noise. They like the sound of the engines, and without it, interest will drop off significantly. In many ways, it's a car's sonic signature. Back in the day, people loved to hear the sound of the Novi V8 when it ran at Indianapolis, and I have no doubt that it drew more spectators to the Speedway when it raced.

The same goes for the Offy and the Cosworth V8. The spectators connected with the distinctive engine sounds produced by different manufacturers. That's still true today. Look at all the negative feedback IndyCar received when it switched over to turbocharged engines and the cars suddenly got quieter. If people didn't care about engine sound, there wouldn't be aftermarket exhaust systems on all these new cars out on the highway now.

While an internal combustion engine is more complex than an electric motor, it also provides much more opportunity for innovation in tuning and setup. There are far more variables involved, and that allows people to take a number of different approaches to make their cars more competitive.

If we look back at the history of internal combustion, these engines started out with massive displacement and relatively little power output. But as time has gone on, the displacements have gotten smaller while the power has gone up. Plus, now we're seeing more and more use of forced-induction systems. We're also seeing electric motors serving as supplemental power sources in disciplines like Formula 1, and I think these hybrid systems will continue to see development and more widespread use for a long time to come.

Electric powertrains will improve and become more useful in a wider range of applications over time, too. But the one thing they're not going to have is the sound, and that's going to be a significant obstacle going forward.



ELECTRIC MOTORS ADVOCATE:
John Metric,
Lonestar EV Performance

"WHAT KIND OF INTERNAL COMBUSTION ENGINE CAN MAKE 1,000 LB./FT. AT 1,000 RPM? THERE JUST AREN'T ANY."

The first thing to consider is complexity. An electric motor typically has one moving part—the rotor—and two bearings, and that's a big advantage. An internal combustion engine has valves, springs, pistons, a crank, one or more camshafts, a fueling system, the list goes on. So it stands to reason that an electric motor is going to require less maintenance, and the mean time between failures with electric motors is usually measured in orders of tens of thousands of hours. If the cooling is sufficient, there are only two wear parts in the motor: the front bearing and the back bearing.

Then there's the safety aspect. Battery fires are still an ongoing concern for some sanctioning bodies, but a damaged battery generally gives a racer much more time to escape the car than, say, a punctured gasoline tank that is spraying fuel onto a red-hot header. With an electric powertrain, it will typically take several minutes for a fire to develop into flames at that level, so safety teams can respond to the incident, extract the driver and possibly take some precautionary measures before anything significant happens.

Electric motors also develop power very differently than an internal combustion engine does. When we look at a dyno curve for an internal combustion engine's torque, we focus on the peak numbers. But when we look at an electric motor and an internal combustion engine that make equivalent torque—let's say 1,000 lb./ft.—the internal combustion engine is only making that number at one specific rpm, whereas the electric motor will typically make that 1,000 lb./ft. from 0 rpm all the way to whatever the motor's nominal rpm rating is. So if a drag racer bogs at launch and the rpm's drop, the full torque rating of that motor is still available. I mean, what kind of internal combustion engine can make 1,000 lb./ft. at 1,000 rpm? There just aren't any. There's a clear benefit in terms of power delivery. The electric motor is going to have more out of the hole, and it will just keep pulling and pulling.

This certainly has advantages in drag racing, and there are already a number of disciplines where a comparison of raw EV results to ICE results shows where this technology really works. The Pikes Peak hill climb, for instance: For a number of years now, an electric motorcycle has had the overall fastest time for motorcycles, and electric cars have been extremely competitive against the gas-powered cars up there for the past five years or so. An EV prototype built by Volkswagen currently holds the overall lap record. Thinner air doesn't affect an EV powertrain like it does an internal combustion engine.

We have to understand that widespread adoption will take some time, though. Back in the 1950s, when drag racing really started to take off, kids were taking cars that were already 20 years old and kind of discarded, and hot rodding them. Right now, it's tough to take a Tesla that might only be three or four years old and turn it into a race car. But the 'hack rod' is coming. PRI

STOP DOING THAT...DO THIS INSTEAD

PISTON RINGS

Rings are among the hardest working parts in an engine, but often don't get the attention they deserve. Here's what you need to know about modern piston rings direct from those on the front lines.

By Alex Nishimoto

No matter if the job is done by a seasoned engine builder or a complete novice, small mistakes can have big consequences when it comes to selecting and installing piston rings. After all, the rings have many jobs to do, from maintaining a tight seal under immense pressure to managing heat inside the cylinder to scraping excess oil off the walls and leaving just enough to lubricate the piston on its way up.

How piston rings work, and how important they are to an engine's operation, is common, Engine Building 101 knowledge. Yet even in the performance world, misconceptions and outdated information about these key components keep cropping up. We spoke with experts on the subject to find out what builders should be doing to get the most out of their rings.

NEVER ASSUME

This first bit of advice seems like common sense, but time and time again Keith Jones of Total Seal Piston Rings in Phoenix, Arizona, is greeted by horror stories from customers come Monday morning—after the fact when the damage is already done.

"Make me your first call, not your last," he said. "We can sort all these problems out before you start."

There is so much bad information, especially on the Internet, that Jones said when in doubt, consult the manufacturer.

For example, when using a power adder, do the rings that came with the pistons look too skinny? Give the sales rep a call and double-check that they're the right ones for the application.

Jones also strongly recommended checking to make sure rings are available before ordering custom pistons. "Small runs of rings get very expensive," he said. "It's going to cost me as much to make the rings as it was for you to buy the pistons."

BE OPEN TO NEW THEORIES AND PRACTICES

Don't take the engine building tips passed down from your granddad as gospel. A lot has changed with piston rings in the past few decades, as Dan Begle of MAHLE Aftermarket in Farmington Hills, Michigan, can attest.

"Years ago, performance development drove the OEMs, but now it's the other way around," he said. "As engines are becoming more efficient and performance-oriented, that technology trickles down to the performance world."



Engine builders should always verify that rings are available before ordering custom pistons. "Small runs of rings get very expensive," said our source from Total Seal. "It's going to cost me as much to make the rings as it was for you to buy the pistons."



According to our source at MAHLE Aftermarket, thinner modern steel rings can often do the same job, if not better, than a thicker ring of an older design. Pictured here is an older 1/16"—1/16"—3/16" piston/ring stack-up (at left) versus a newer-style 1.0-mm—1.0-mm—3.0-mm stack. "As you can see," he noted, "there is considerably more piston skirt, which allows [for greater] ability to control the piston."

With that in mind, thinner modern steel rings can often do the same job, if not better, than a thicker ring of an older design. "You can get by with a thinner ring using a better material," Begle said, "so you can carry more heat out even with less thickness. You can run a 1 mm ring and pull more heat out than a 1/16th-inch cast ring."

But old habits die hard. "There are many people still using late 1990s technology in their engines, which is like choosing a Nokia brick phone when you could have an iPhone," said Total Seal's Lake Speed, Jr. "People still buy 5/64th rings, which is like a rotary dial phone!"

KNOW YOUR OPTIONS

With so many different piston ring base materials and face coatings available, choosing the correct rings for an engine can be an intimidating task. Two materials—ductile iron and cast iron—can be crossed right off the list, as they're outdated and surpassed by carbon steel rings in their ability to dissipate heat and hold up to high cylinder pressures.

Another type of ring to eliminate is chromoly, because it doesn't exist. That persistent misnomer likely originates from a conflation of chrome, a coating once used for performance rings, and moly (short for molybdenum), a coating still used today. Jones cited this common misconception as yet another example of the misinformation that pervades the industry. To this day he encounters customers who insist they have chromoly rings.

A real coating to consider is chromium nitride (CrN), also known as physical vapor deposition (PVD). It's a solid choice for top rings as the coating is low-friction, wear-resistant and easy on cylinder walls.

"Even experienced engine builders can benefit from learning what ring and face coatings are out there," said Begle. "Technology has changed so much. Just because you ran that ring before doesn't mean it's the latest and greatest. There are better options out there."

INSTALL WITH CARE

Our sources suggest going back to the basics to fine-tune engine-building techniques. Gapping rings, for instance, is an easy-enough procedure, but there's so much riding on getting it right that it's worth taking a second look at the process.

Use a good squaring tool to ensure the ring is square in the bore before measuring the gap. When adjusting it, only file one side of the end gap from outside to inside. "Don't put big chamfers on them. You're not trying to put a bevel on it," said Jones. "Just lightly debur the edge."

Begle agreed that slow and precise is the best approach. "Getting the gap symmetrical and parallel in the bore is key," he said. "People can get overzealous with deburring. When building an engine, you want to be on the cautious side."

Another thing to get right is the cylinder hone. "Honing is as important as making the right ring selection," said Jones. "A ring cannot fix a bad cylinder wall."

PROPER BREAK-IN

One thing Jones sees far too often is people using the wrong lubrication to break in rings. "An engine needs friction to break in," he said. "You have to make heat and pressure to seat the rings. If you use an oil with a high amount of friction modifiers, you're over-lubricating."

Use a dedicated break-in oil, he advised. This generally means a low- to no-detergent oil with a low total base number (TBN), a measurement of the number of alkaline additives in an oil. Look for additives like moly and calcium in low numbers, as they reduce friction. One additive he recommended is Zinc Dialkyl Dithiophosphate (ZDDP).

Another pro tip from Jones: "Make sure you get a proper fuel map before you start the engine. A fresh piston and ring package will not tolerate fuel wash. An overly rich fuel mixture will wash the lubrication right off the cylinder walls." PRI

SOURCES

MAHLE Aftermarket
mahle-aftermarket.com

Total Seal Piston Rings
totalseal.com



NEWLY APPOINTED

VIC WOOD

A familiar face in NHRA and World of Outlaws pits, Vic Wood brings decades of experience to Midwest builders in his new role with Race Winning Brands.

By Jim Koscs

As the new regional tech support manager serving Race Winning Brands' Midwest accounts, Vic Wood is spending plenty of time on the road visiting engine builders, performance shops and distributors. When PRI caught up with Wood, he was driving to his next appointment "in the middle of the cornfields" in Missouri.

Wood's background makes him an ideal fit for this role. Before leaving his native Australia for the US 20 years ago, he was a drag racer and dirt oval competitor in midgets. His 40-plus years in the automotive aftermarket include stints with Hedman Hedders, Aeromotive, McLeod Industries and Weld Wheels, as well as roles with SEMA and its Industry Councils, including MPMC Chairman. The NHRA, SEMA and MPMC have recognized Wood for his work.

Talking with PRI, Wood shared his thoughts on the importance of face-to-face meetings in marketing performance parts today.

PRI: What are you most looking forward to in this new role at Race Winning Brands?
Wood: Meeting the customers and learning the challenges they face.
PRI: Describe this new role and why it's important to the racing industry.
Wood: It's great to have a website with all your products, but it's another thing for the end user to really understand what a product does and how it can be used for different applications. We constantly see that customers have information overload. For example, many parts these days have new high-performance coatings that can extend their reliability and performance. I need to get into their workplace and understand what they're doing, to see if we have product that can help or can we develop a product to specifically address their particular need.
PRI: How does your racing and business background help to serve the businesses and race teams you visit?
Wood: My background gives people some level of confidence in my understanding of the products and the processes engine builders go through to achieve their goals. It gives them confidence that the person they're talking to has some knowledge of the challenges they're trying to meet.

"I STILL HAVE A LOT OF FAITH IN FACE-TO-FACE MEETINGS. IT'S A LITTLE OLD-FASHIONED, BUT I CAN REALLY LEARN ABOUT A BUSINESS BY SPENDING TIME THERE."



VIC WOOD

TITLE:
Regional Tech Support Manager

ORGANIZATION:
Race Winning Brands

HOMETOWN:
Overland Park, Kansas

FAST FACT:
Wood once drove a 245-mph roadster at Bonneville. Today, he enjoys his self-built 1964 Chevy C10 pickup, powered by a supercharged 410-cubic-inch Dart Machinery-equipped engine.

PRI: In an age of increasingly digital interaction, why is the face-to-face interaction you will provide to racing businesses and customers so valuable?
Wood: A lot of this work is now done in email or other remote communications, but I still have a lot of faith in face-to-face meetings. It's a little old-fashioned, but I can really learn about a business by spending time there.
PRI: What does personal interaction offer that digital can't match?
Wood: I see many cases where people know our brand names but are not aware of all the products we offer. It's also good to see what products they are using and trying to expose them to ours.
PRI: What do you see as the biggest challenges ahead of you?
Wood: It can be a challenge to get someone to try something new. It's human nature that if something has always worked for you in the past, then you might not want to change.
PRI: What are your top strategic goals for the next 12 months?
Wood: I want to physically visit as many customers in my territory as I possibly can. I want to establish new relationships and maintain relationships established by previous people. A lot of what I do is simply building relationships.
PRI: What's your most gratifying professional accomplishment?
Wood: I would say being accepted by crew chiefs in NHRA and World of Outlaws racing. It takes a lot to win their trust. I have a great relationship with Joe Gaerte [in World of Outlaws]. His father, Earl, was one of the great sprint car engine builders. My friendship with the Gaerte family is something I'm proud of.
PRI: Who has been the biggest influence in either your professional or personal life, and why?
Wood: I have a great relationship with former SEMA President Chuck Blum. He had a lot of faith in me to enable me to come from Australia to work for SEMA. Both Chuck and former NHRA and SFI Vice President Carl Olson significantly influenced my career.
PRI: Who inspires you, and why?
Wood: Mike Stewart, a very well-known engine builder in Australia, took me under his wing when I was in my late teens. He taught me a lot and remains probably the best friend I've ever had. We maintain our friendship to this day. If I've ever made someone proud, I'd want it to be Mike, because of everything he did for me, sometimes without even knowing it.

Over the past five years I have enjoyed a great friendship with Don Schumacher. I hold his friendship and counsel in very high regard. In the early days traveling from Australia to attend SEMA and PRI, I received great advice and oversight from SEMA Hall Of Fame member Dennis Holding and my great mates Rick Rollins and Ron Funfar. Most importantly, my beautiful wife Arlene (herself a former 30-year employee of SEMA) who has been my "rock" over the past 25 years and still inspires me every day.
PRI: What is a recent or past mistake you've learned from?
Wood: There have been times in my life where I allowed myself to drift when I would have been better served staying focused on one thing. So, something I've learned over the years is to stay focused on what you're good at. Don't take a side road. PRI







INDUSTRY INSIGHTS

KYLE TUCKER

Kyle Tucker's career path has followed all the twists and turns of the road courses where his companies' products appear, from racer to engineer to business owner. Here he shares some of his career highlights, from racing in the Baja 1000 to being the only two-time SEMA Battle of the Builders winner.

By Dave Argabright

Kyle Tucker is a good example of how motorsports and performance can have a profound impact on one's life and direction. A native of Missouri, Tucker was exposed to auto racing at an early age and was immediately smitten with all the elements of motorsports: the sights, the sounds, the sensations. In his teens he raced stock cars and midgets and aspired to become a professional racer.

Fate—and the realities of life—would intervene. With guidance from a caring mentor, well-known Missouri car owner and track promoter Ray Marler, Tucker changed his direction to pursue an engineering degree with the ambition of spending his life working in the performance industry. Upon graduation Tucker relocated to Detroit and joined General Motors as an engineer and test driver, and it appeared his path was set.

"I'VE BEEN BLESSED THAT I PICKED THE RIGHT PEOPLE TO HELP ME WITH THE THINGS I DIDN'T KNOW HOW TO DO."

Tucker was soon exposed to road racing and autocross, and his destiny was forever altered. He began working on vintage muscle cars—specifically, a 1969 Camaro—and designed and built a number of pieces that dramatically improved the car's performance. As others took note and wanted to buy his parts, Tucker's dreams of engineering morphed into company ownership when he launched Detroit Speed and later GearFX. The two companies would grow to become leading entities in the performance marketplace.

After moving his operations to Mooresville, North Carolina, Tucker's visibility widened when he and his Detroit Speed colleagues captured the inaugural SEMA Battle of the Builders competition in 2014. They claimed the title again in 2018 and remain the only repeat winners of the coveted contest.

In 2020, Detroit Speed and GearFX were acquired by Holley Performance Products, but Tucker continues to serve as president of both entities. He is also a member of the BFGoodrich Performance Team and continues to pursue a limited amount of racing competition, including the Baja 1000.

Industry Insights recently visited with Tucker to get his thoughts on his career path and various issues that are impacting the performance industry.

PRI: Let's begin by talking about the two companies you've focused on these past few years: Detroit Speed and GearFX. Give us a quick synopsis of what each does.

Tucker: We built the company around first-generation Camaros and kind of expanded around that. That was the first car I had, and built and designed a lot of parts for, and that's where it started. I was heavily influenced by the Penske/Donohue era of Trans-Am road racing and loved Camaros. At the time street rods were very popular. I wanted to build a car that was highly detailed but very functional. That was about the time when Pro Touring [began], and as I designed some parts and started building cars, the company was started in 2000 to get some cash flow. Detroit Speed is there to provide modern designs and manufacturing techniques to create parts for older muscle cars, to transform them into a car that is fun and safe and reliable and easy to drive. That goes across many platforms today.

GearFX is kind of a similar mentality to Detroit Speed, and is kind of the upper end for the customers who really appreciate good quality. There are a lot of gear builders who build performance rear gear sets and transmissions, but our goal at GearFX is to, well, it's kind of like a small block Chevy. You can take parts out of any catalog and build an engine that runs pretty well. But if you size and match and set tolerances, it can run a lot better. That's what GearFX does. We strive to build an upper-end gear set that is quiet, which is important. Today the lines get very blurry between performance/racing and street car people. People want the performance, but they also expect it to be consistently quiet. I think that is an underserved area of the market. All these race builders building gear sets have not focused as much on the quiet, and that's what we have strived to do. Even though we still build NASCAR gear sets for teams, it's that mindset that still goes into a street gear as well.

"I FEEL LIKE WE'LL ALWAYS HAVE THE NEED FOR THE HOT ROD MODEL A TO THE 1955 CHEVROLET TO THE '69 CAMARO WITH A SMALL BLOCK OR BIG BLOCK."

PRI: You have an interesting path, from farm kid to college student to aspiring racer to GM employee to company owner. It's one of those stories where it's probably unlikely you could have plotted out this path from the beginning.

Tucker: You know, that's right. It just came about because I'm such an enthusiast for anything that goes fast and has four wheels and tires. It actually goes back a lot to Ray Marler, who is an engineer by trade. When Ken Schrader went down to the Carolinas to race with NASCAR, Ray started getting bored because he didn't have a Silver Crown car anymore. I was working part-time and was tapped out; I couldn't afford to build even a competitive go-kart. Ray wanted to buy a car to race locally on Saturday night. He said to me, "I'll buy it and support it and teach you how to race, but you have to maintain it."





Detroit Speed founder Kyle Tucker has built an enviable career that combines his engineering background with his love of racing and vintage muscle cars.

What high school kid who wants to race could turn that down? So we did that and tore up a bunch of his cars, tires and wheels that first year when I was 15. The next year we won a lot of races and kept the car clean, and that was my entire focus.

I wanted to race, and we were getting more and more competitive. I also started driving a midget for a guy in St. Louis, and Ray helped me a little bit with that, too. I'll never forget, we crashed one night in turn four and were walking back to the pits with my helmet in one hand and the steering wheel in the other—that's about all that was left of the car—and Ray was walking beside me. He said, "You know Kyle, you're a smart kid and you're a pretty good racer, but you might want to rethink this racing thing." I thought about it for the two hours driving home and figured maybe I should think about things. My mom and dad wanted me to go to school, and I decided if I studied engineering, I could figure out how to make a car go faster. And be a better racer, too.

PRI: When did you become really immersed in the muscle car scene? Was there a moment when you began to feel like there was a place for you in that industry?

Tucker: I grew up in Southern Missouri, and with all the dirt tracks there, you can race three or four nights a week in the summer. That's all I knew. As I got into engineering school, I couldn't race dirt tracks as much, and I was fortunate enough to get a college co-op position to help pay for school and get some experience at GM. As I did that and was spending more time in Michigan, there weren't a lot of dirt tracks up there. I got into a clique of guys who did some local road racing, and I really liked doing some of that. I wanted to learn about it. Because I was at GM and was doing some test driving and working on the testing of vehicles, I got into road racing and autocross. That's how it started.

"IT'S SCARY IF LEGISLATION CLAMPS DOWN AND DOESN'T ALLOW US TO HAVE GAS-BURNING CARS."

PRI: Leaving GM to strike out on your own must have been a leap of faith, so to speak. Was that how it was? Was there an internal debate on what you wanted to do?

Tucker: It was clear to me that I was getting busier and busier on the side, designing parts and working on people's cars. And working on my car. I didn't really think about it being a company, it was kind of a side hustle. I could work on other people's cars and design a few parts on the side. It quickly took off, and I got to the point where I was busier at home. I started to see the potential, and it was almost like my day job was getting in the way. I wondered if I could make something of it. I was in my late 20s and figured if I was ever going to do something like this, now was the time. My director at the GM Proving Grounds was a car guy, and he knew my situation. We'd always swap car stories. I went in to tell him what was happening and ask for a leave of absence. "I might not come back, but if it doesn't work out in six months would you give me my job back?" He agreed and offered me a one-year leave. He was confident that I could make it work. I took a year's leave of absence, and I never went back.

PRI: To transition into that role, it's one thing to know the engineering, know the cars, even know your market…but running a business is a very different world. Was that part of the educational process, owning your own business?

Tucker: It sure was. As I took my leave of absence, I had a two-car garage at home and later built a slightly larger garage in the backyard and outgrew it. Then I started to get part-time employees and then full-time employees, I think I had two in the backyard with me. I still wasn't paying myself but was paying my employees. But we kept getting more jobs in, and I quickly realized that I didn't know anything about business. I'm an engineer and a racer, and it was always the school of hard knocks to learn the business side. If there was anything I did right, I hired people who could take care of that side of the business. I learned from them on the business side, whether it was accounting or marketing or social media. I guess I've been blessed that I picked the right people to help me with the things I didn't know how to do.





In 2014, Kyle Tucker and his company won the inaugural SEMA Battle of the Builders competition with this 1969 Camaro. They won again with a different Camaro in 2018, making them the event's first repeat winners.

PRI: You eventually moved your operations to North Carolina. What led you to make that move?

Tucker: In Detroit at the time, I had moved from the backyard shop because we were out of space. I leased a very small space from Scooter Brothers, who had FAST Fuel Injection in Brighton, Michigan. He leased the whole building and the middle suite was available. In a year I outgrew that space. I kept looking for a space I could buy. I knew [lack of] space was limiting what I could generate in revenue. Detroit was still booming at that time, and I could not afford to buy or lease a bigger space because the market was just too high in commercial real estate.

I had built a couple of cars for a collector in North Carolina, and he told me that Mooresville would be a great place for me. The more I came down to see him to deliver a car, the more I liked North Carolina. It was more like the climate where I grew up in Missouri, more like it than Detroit, for sure. So he took me around Mooresville. His friend had a race shop in Mooresville, and I looked at the building and thought, "Oh my gosh, I can't afford something like this." But it would be ideal for my business.



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So I talked to a banker in Charlotte and scraped together everything I could for a down payment and bought the building. Then we leased it back to the race team that was in the shop at the time. We sold our houses in Michigan, the employees and I, and the next year we moved down to that building. That's where we still are. I bought some adjoining land and have added on some, but that's where we're at.

PRI: The SEMA Battle of the Builders has become a high-profile deal, and you won the first one in 2014 (and again in 2018). How did winning the Battle of the Builders impact you and your company? Was it a milestone?

Tucker: Yes, it definitely helped us. Give credit to SEMA and the people involved who produced that and made it a big deal. It's really one of the awards, if you're a car builder, you shoot to win that award. I wouldn't say that it specifically helped our business from a percentage perspective, but it increased the awareness of our brand. We've been fortunate to be more selective the last seven or eight years about who we want to



The launch of Detroit Speed coincided with the rising popularity of Pro Touring cars, providing a healthy market for the company's robust performance parts.

build cars for, but it definitely helped raise our level in terms of the caliber of cars we build and the customers we work for. That was our biggest realization. To be able to win it twice was a really big deal.

PRI: The muscle cars of the 1960s and 1970s, to be honest, weren't exactly built for things like autocross. But I'm guessing that's the point: develop pieces that allow a car to perform far beyond what it was designed for. Is that part of what makes autocross so interesting?

Tucker: It is. I feel like, starting with the first-gen Camaro, we would go to a road course to develop and test our parts on a track day or autocross day. I remember being laughed at when I pulled up to the line in a 1969 Camaro. Yes, it's a '69 Camaro with bigger brakes and bigger tires, but people still thought it was the '69 Camaro they knew. When you ended up smoking everybody there, or passing BMWs or Corvettes that you shouldn't pass, it got everybody's attention.



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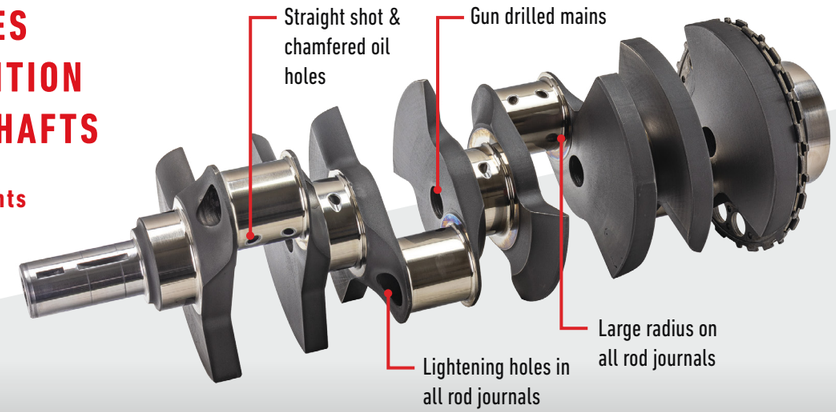

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PRI: Let's talk about technology in terms of the autocross and muscle car performance industry. What's on the horizon? Are there technologies coming that are going to reshape that segment?

Tucker: Chassis and suspension technology has always trailed behind tire technology, and tire technology continues to evolve every year, whether it's circle track racing or road racing or street performance. That's always been the carrot for somebody like me, someone who races. We have to chase that technology, and I still see that leading the way for people in the chassis and suspension world. Beyond that, I also see things like electronic differentials, electric steering, all of that is OE technology that if you're paying attention in the aftermarket, is becoming more and more available and user-friendly to put on the older cars. And now we're talking about electric-powered vehicles.

I think that's probably the next big thing, electrifying some of these cars. You think about a '69 Camaro, it's very mechanical, and it does things that are fun and things that are not so fun. That's kind of the spirit of the older Camaro. But it's amazing what you can put into those cars that retain the look of that era yet have a supercar level of performance. What's coming in the next five years in terms of technology? Traction control, ABS, EV power…all will be available to us.

PRI: Yes, my '69 Camaro is analog. Definitely not digital.

Tucker: (Laughing.) That's exactly right.

PRI: I read recently that you expressed some interest in getting involved in land speed racing at Bonneville. Has that interest led to any specific projects at this point?

Tucker: Not yet. But it's still my interest. George Poteet invited me to come out and hang out with the Speed Demon crew two years ago, and I was supposed to get into the 'Cuda that George built that set all kinds of records. The day before I showed up, they broke both the motors they had, so I didn't get into the car.

PRI: Is it still on your list?

Tucker: It's still on the list. It's kind of like Baja, I've loved racing in Baja. Bonneville and Pikes Peak are two things I still want to do.

PRI: It was interesting to discover that you've raced the Baja 1000 many times. That is a unique, completely different type of racing. How did that come about?

Tucker: I was really fortunate. If there has been any "break" that I got in my driving career, that was it. Ray Marler and the midget deal, and the BFGoodrich connection were the breaks I got. When we were designing some of our muscle car parts, we were limited on what tires could be used for the suspension we ran. I had a great field marketing manager at BFGoodrich stop by the shop one day. He had heard about our projects and was aware of what we were trying to do performance-wise. He stopped in to look around, and he asked what they could do for us. I described a tire we really needed for this market. Long story short, they ended up making that tire, and it really took off well.





BFGoodrich has what they call "influencers" today, but back then it was called the Performance Team. I was invited to join their Performance Team, which was basically anybody BFGoodrich sponsored and was leading their segment in industry or racing. It was a partnership. I've been involved with the Performance Team for over 11 years, and it's made up of asphalt guys, road racers, rock crawlers, autocross, off-road racers, everything.

BFGoodrich always enters a car in the Baja 1000 and takes a tire that needs to be tested and developed. They get a lot of feedback from the real world of Baja. I was fortunate to be invited to do that one year, and we ended up winning. I was hooked on it, because it was a mix of everything I had learned to do in a car. Growing up on dirt tracks, to controlling the car on gravel and dirt, to autocross. It's a driving technique where you're going high-speed on a gravel road, mixed with dirt racing, and slow speed picking through dry creek beds. Your eyes are always scanning way ahead on the track, or up close like you do in autocross. It was a mix of everything I love to do. And I love the endurance aspect, and the competitiveness, the wheel-to-wheel part of it. It checked all the boxes for me, and I still love doing it.

Kyle Tucker is a member of the BFGoodrich Performance Team, which puts him behind the wheel for a number of off-road events, including the Baja 1000.



PRI: You did some short track racing in Late Models and midgets. For most people who are involved in racing, they never really get that out of their system. Do you ever still get the urge to go short-track racing?

Tucker: (Laughing.) I sure do. I go to bed almost every night watching streaming of short-track races, or watching sprint cars on YouTube, and that's probably one of my only regrets: Not getting in a winged sprint car and having a chance to be good at it. I did







Detroit Speed and sibling company GearFX were recently acquired by Holley Performance Products. But Kyle Tucker remains president, infusing the brands with his unique passion for performance.

get in one a couple of times. My employee Andy Stapp got me in one a few years ago just to make some slow hot laps. But it's something I always wished I would have done. And I can definitely attest that it's not out of my system. I still love the midgets. But I also know I'm 51 years old and have some responsibilities, and I probably shouldn't wake up in the hospital on Monday morning wondering what just happened.

PRI: A lot of people in the performance industry express some concern that not enough young people are getting involved in our industry. What's your take?

Tucker: I think it is a problem. It's something I believe strongly in and work within our community and with SEMA to do anything I can to help young people get into racing or get into cars. Or just into our industry in general. I see a big gap, even from the employer side. When you and I went to school, we could take shop class and learn to build a little toolbox tray or whatever. They don't even offer that anymore. College is not for everybody, and it's hard to hire enough skilled welders, or even entry-level welders today, let alone CNC machinists.

When I was saving up to get a race car, or a street car, you didn't have to worry about buying a $1,000 phone. I was worried about buying an $800 car of some kind that I could race or fix up. There's a lot of competition for

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kids to choose between a phone that has a potential level of infinity in terms of what you can do with it, versus saving up to get into a car when you're 16.

PRI: What's your take on electric vehicles in the performance segment? Specifically, what do you hear from your customers and colleagues? Many in our industry don't view EVs as an opportunity, they see them as something to be concerned about. Are EVs an opportunity or a concern?

Tucker: They will definitely be both. For example, Chevrolet is working on taking some of the components from the Bolt EV and trying to make a crate motor concept. It's not for the do-it-yourself person yet, but I think that will happen. And I hope that the ARPs and Clevites and Eagle rod companies don't go away. They could only go away if our government basically put a stop to the emissions of some of the aftermarket vehicles. It's getting tougher and tougher every day to get past that. I really hope within the next 10 to 15 years that does not happen, because I feel like we'll always have the need for the hot rod Model A to the 1955 Chevrolet to the '69 Camaro with a small block or big block. And we'll also have people who want that with electric power. It's an exciting time to have all those options, but I agree, it's scary if legislation clamps down and doesn't allow us to have gas-burning cars.

PRI: Let's talk about the overall business climate in America. What's your biggest concern right now for the future of the performance industry?

Tucker: Definitely the two things we mentioned: Bringing enough young people into the industry, and government legislation. If they crack down far enough to not allow us to use non-emission-control vehicles on the street—let alone racing—those are my two biggest concerns right now.

PRI: Your company was recently acquired by a larger entity. How did that process come about?

Tucker: Holley Performance Products purchased Detroit Speed last year, and GearFX as well. They came to us about five years ago, and I said, "No," and they came to me again last year. I know Tom Tomlinson, their CEO; we're good car-guy friends. He started calling me, and I said we still aren't for sale. But maybe we could talk about how we might work together. Tom's a smart guy, and a smooth guy, and he suggested we just set up a weekly call and start talking. About five or six weeks into those calls we started to talk about a possible transaction, and it just came together and made sense.

For me now, not being the owner and the general manager of two operations, I'm in transition where I'm helping them with some new product engineering and development, and still doing some driving to test development parts. But I've also started to work on my personal projects that I had set to the side. Building cars and trucks I've wanted to build along the way. Now I have a little more time to do it.

PRI: Kyle, we appreciate you taking some time to talk with us. All of us at PRI wish you and your colleagues the best in the coming months.

Tucker: Thank you, Dave. I've enjoyed talking with you. PRI

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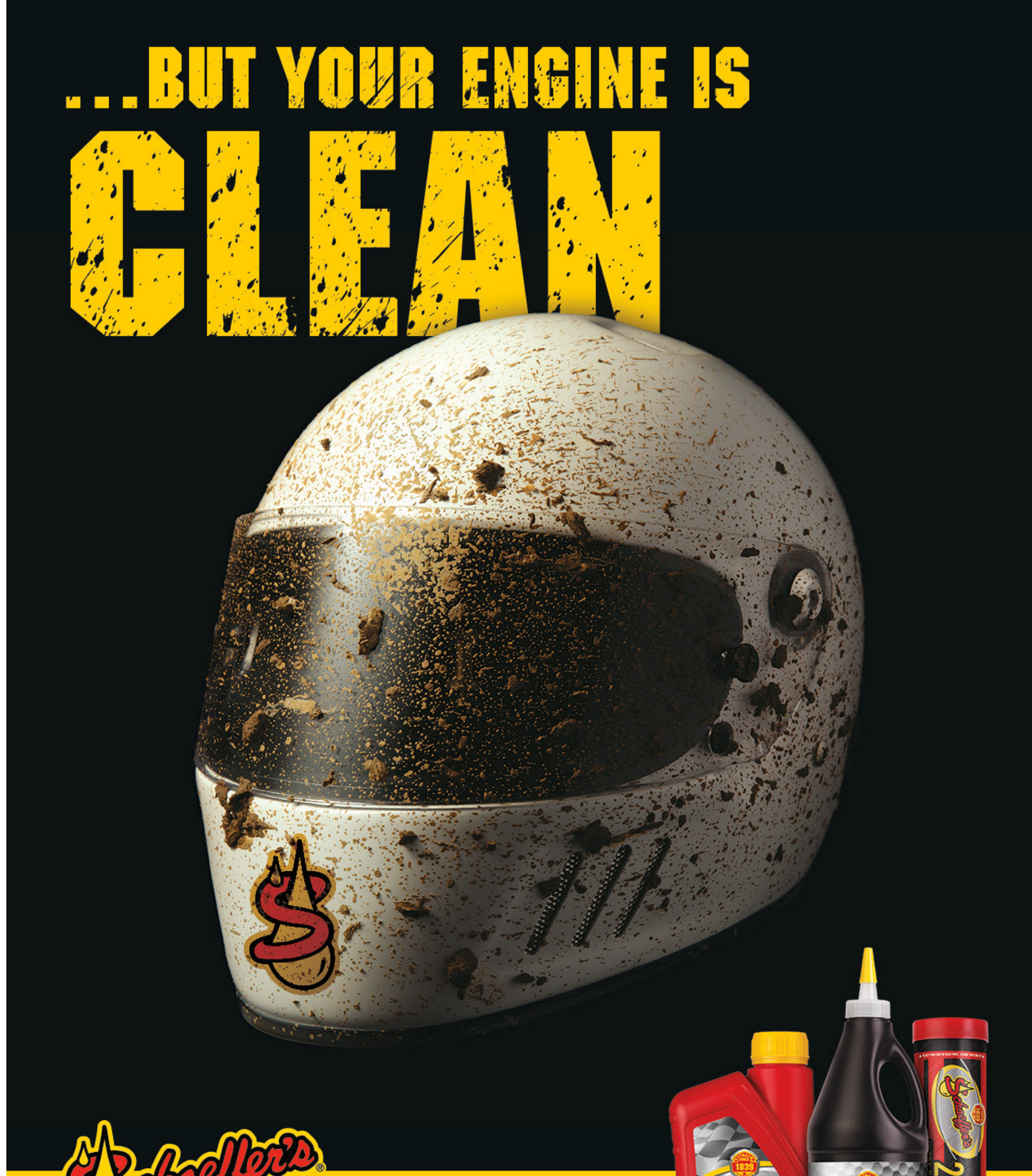

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SAVEOURRACECARS.COM CHAMPIONSHIP NIGHT

A special PRI-sponsored program at Wisconsin's Madison International Speedway focuses attention on passing legislation critical to the motorsports industry.

By Mike Magda

A full night of racing at Madison International Speedway (MIS) took on added importance as fans and competitors were introduced to industry efforts to fight federal policies that threaten the future of motorsports in America.

Through a partnership of MIS and Performance Racing Industry (PRI), the SaveOurRacecars.com Championship Night was staged August 20 at the Oregon, Wisconsin, paved half-mile oval.

"It was highly successful," reported track owner Gregg McKarns. "A lot of people who enjoy short-track racing were unaware of what's going on."

The Save Our Racecars initiative is designed to prevent government overreach targeting auto racing—specifically the Environmental Protection Agency (EPA) promoting a position that prohibits street cars from being converted into race cars. The EPA position also takes direct aim at the sale of aftermarket parts used for those conversions. The EPA claims its authority is drawn from the 50-year-old federal Clean Air Act (CAA); however, it was only in 2015 that officials began interpreting the law to include race car conversions.

PRI, along with SEMA, are working with lawmakers in Washington, DC, to pass the RPM Act, which stands for Recognizing the Protection of Motorsports. The measure (HR 3281) was introduced in the US House of Representatives in May of this year, and within a couple months at least 101 House members from both sides of the aisle had signed on as co-sponsors.

"The EPA's interpretation of the law threatens race tracks like Madison International Speedway by prohibiting the conversion of street vehicles into vehicles used exclusively for racing," noted Daniel Ingber, PRI/SEMA's Vice President, Government and Legal Affairs in Washington, DC. "Congress needs to pass the RPM Act right away so racing enthusiasts nationwide can continue to enjoy motorsports."

PRI/SEMA has also challenged the EPA in federal court on this question. While the court did not address the issue directly, it did offer positive statements regarding the government's burden of proof in such cases. Passage of the RPM Act is considered essential to avoiding EPA overreach, and to that end more than 1.35 million letters have been sent to lawmakers urging their support of the measure. Much of this industry backing has been generated by partnerships similar to the PRI-MIS venture.



Fans and competitors at Madison International Speedway in Oregon, Wisconsin, were recently introduced to industry efforts focused on preserving and protecting the future of motorsports in America.

RAISING AWARENESS

The MIS racing program was an ideal platform for promoting the RPM Act and informing the racers and fans of the PRI/SEMA legislative efforts. The track hosted four classes that night, and three of those divisions involved converted production vehicles.

"These guys are true hobbyists but not necessarily those who would attend PRI," added McKarns. "Yet, they spend a lot of money in the aftermarket converting street cars into race cars."

At the entry level, the track hosts 6shooters, a class designed for six-cylinder domestic nameplates. The Bandits are four-cylinder production vehicles, and the MISfitz class is a catch-all division that's like index racing on the drag strip: The cars can't lap quicker than 20 seconds.

"Probably half that field is production-based," noted McKarns. "These classes are heavy into wheels, tires, suspension components and, of course, safety gear. There are also some light engine modifications, even though they're not supposed to."

Four seasonal champions were crowned that night in front of some 2,500 fans in the stands. The pits were packed with 102 race cars. There were almost 25,000 views on the track's Facebook page during and just after the event.

"The race was fabulous," said Tom Deery, an advocacy representative for PRI who worked with MIS to set up the event. "There was some great racing that night, but more importantly, we had a chance to meet and talk to many of the participants who ultimately would be or are affected by the EPA's overreach. We explained to them the potential of that interference with our business and how it will affect them."

The PRI-MIS alliance began last year during the COVID-19 pandemic when Dane County officials placed heavy restrictions on outdoor events, a move that affected a total of four area tracks, including a second facility owned by McKarns in nearby Sun Prairie. Despite the lobbying efforts of PRI, racing was shut down in the county until the COVID restrictions were lifted earlier this year.

"Gregg reached out to us as a thank you and asked if we'd be interested in naming one of the races SaveOurRacecars.com Championship night," recalled Deery. "It was Gregg's idea, and the origin was probably the work that we did together in 2020 trying to get the tracks open that had COVID restrictions."

In addition to banners placed strategically at the gates and victory lane, Deery set up a booth to pass out literature and SaveOurRacecars.com decals to the spectators.

"We received handshakes, fist bumps and thank you's," said Deery. "We met a lot of people who participated in our letter-writing campaign."

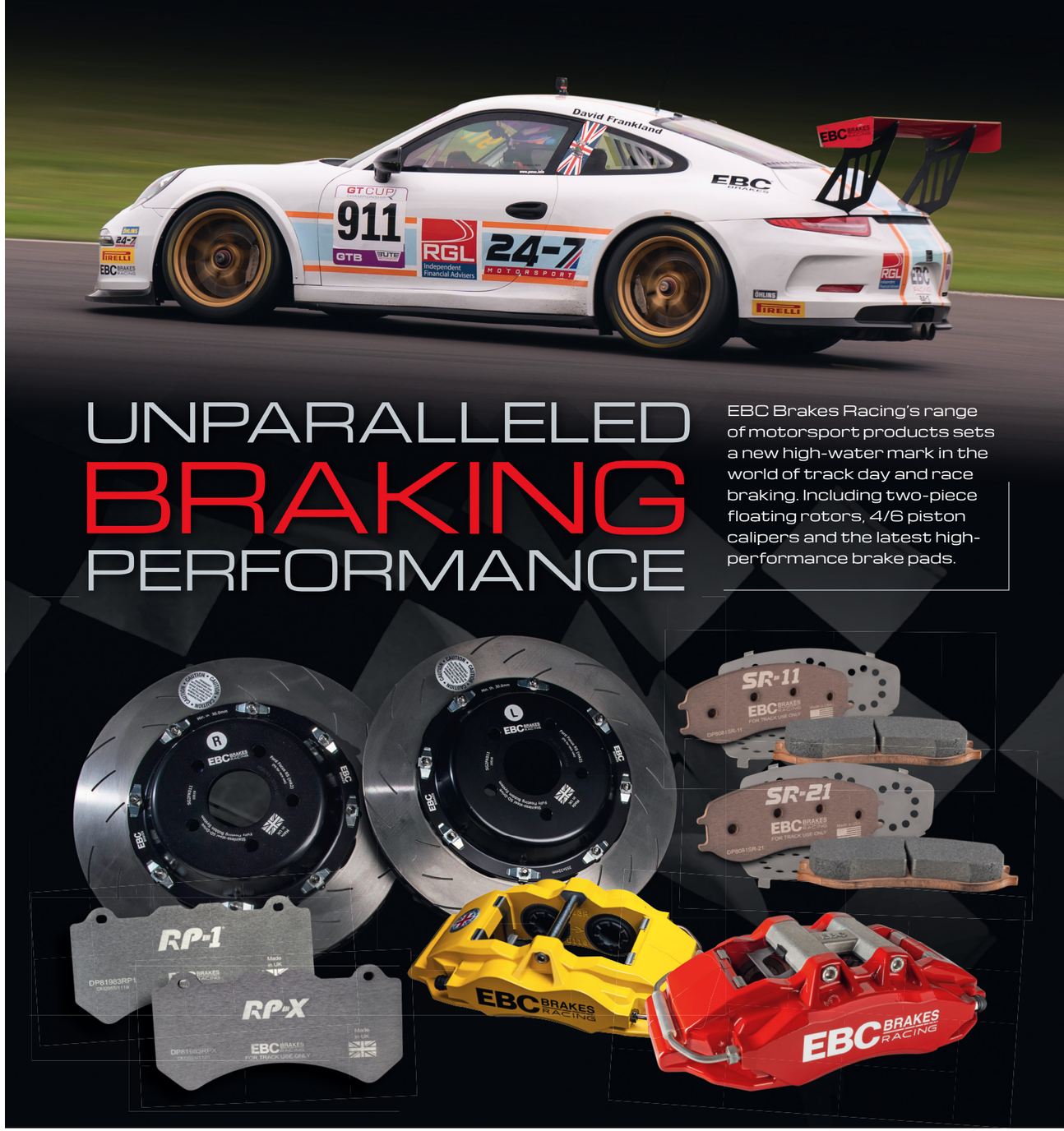
Deery also spoke at the drivers' meeting, spending most of the time with racers from the three divisions that will be affected the most by continued EPA actions.

"They had Super Late Models, but they also had three other classes in which their origins are based on street cars," said Deery, noting that one of the comments directed at him summed up many of the racers' feelings: "I had no idea it affected our cars. We're just the little guys."

"Now, for the purpose-built race cars, that act doesn't specifically address their cars," continued Deery. "Our approach is that, more importantly, it affects the people who manufacture the parts that they use. Whether it's a company that builds heads or intakes, or ignitions or exhaust systems, each of these steps that EPA takes can impact their business, because they've certainly widened their net to include wholesalers, retailers and ultimately the installers. This could seriously affect their business and ultimately affect the purpose-built race car business as well."

From left, PRI Ambassador Tom Deery and Madison International Speedway owner Gregg McKarns served as key points of contact and information during the recent SaveOurRacecars.com Championship Night.





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The MIS racing program—where three of the four classes featured converted production vehicles—was an ideal platform for promoting the RPM Act and informing racers and fans of PRI/SEMA's legislative efforts.

Officials followed the message from MIS by making similar announcements at tracks located in Cedar Rapids, Iowa, and Sun Prairie that weekend.

"We spread the word in the pits, at the tracks and through social media," added McKarns.

Racer interest in PRI was also quite high, with many asking about the Trade Show's status and the cost to attend. Some of those in attendance purchased PRI individual and business memberships.

Chief Motorsports' Steve Dickson, a regular competitor in the Pellitteri Waste Systems Bandits category at MIS, has been racing since the 1980s. "Racing is a release, a stress reliever. I don't golf, I don't fish, I don't hunt; this is what I do," Dickson said. He also works with the Big 8 Series, the eight-event Late Model tour in Northern Illinois, Minnesota, and Wisconsin.

When Deery asked him if he was aware of the EPA's potential to target his street-car-converted race vehicle, he was indeed familiar and had a unique perspective on the issue. Formerly serving in roles—tech official, tire seller, and later race director—at Rockford Speedway in Loves Park, Illinois, Dickson is currently Rockton, Illinois' chief of police. And working in the government, he understands more than most about the delicate and sometimes lengthy process to pass legislation.

"I've been in government for many years and understand how laws get created," he said. "But there's usually a means to an end, and in almost every case, there's a law of unintended consequences. Is that what we're dealing with, or is it a purposeful event meant to destroy part of an industry?

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Those on hand for SaveOurRacecars.com Championship Night "learned that PRI is more than just a trade show," noted PRI Ambassador Tom Deery. "Whether it was the COVID restrictions and now working with the RPM Act—it shows our eyes are on the entire industry."

"The EPA is a regulatory agency, and it's awfully difficult for Congress to oversee those. Basically, they can create their own regulations and fine structure," he continued. "To me, that's outside the realm of what we were founded on. We're supposed to be a nation of laws, and now we're a country of regulations."

Dickson understands the importance of making your voice known by asking lawmakers to vote to pass the RPM Act. For those who think one voice doesn't matter, he believes that it does.

"The people we put into elected offices never hear from us," he said. "We complain to each other and on social media, but we never contact our elected representatives. They want to hear from us. Send them an email, say whatever your thoughts are, and I guarantee you will get a response 100% of the time.

"So many people say, 'I'm just one person. It doesn't matter.' But send the email. It does make a difference," added Dickson.

For Ronnie Osborne of Osborne Racing, the RPM Act means everything to his lifestyle. "I don't know what I would be doing if I wasn't racing," he said. "I've been going to races for as long as I can remember. My dad, who worked on the safety crew at Madison, has been taking me there since I was a kid. Once I had the time and money, I got my own car for the 6shooters class before moving up to Bandits. My dad's driving my 6shooter now."

Osborne drives for and owns the four-car team, which primarily competes at MIS, located about 10 miles from team headquarters in Fitchburg, Wisconsin.

"During summer, we're at the track every Friday, Saturday, and sometimes Sunday and Thursday," he said. "It started with my family, but the more I've raced, the more friends I've made. We hang out in the pits and work on our cars together. If somebody has an issue—it doesn't matter who it is—everybody helps. It's the atmosphere you like to see: people helping each other out."

But, as Osborne noted, his summertime racing could be gone for good if the EPA has its way. "As [PRI Track Ambassador] Tom explained it, the EPA's interpretation doesn't affect higher-level classes of racing, but affects me, my family and our cars at our local track.

"Local tracks are important," Osborne continued. "If you look at top-tier drivers like those in NASCAR, IndyCar, wherever, they all had to start somewhere. I don't know if there would be any NASCAR if it weren't for grassroots racing. Sure, there are simulators, but those only teach you so much. There's nothing like the experience of the track.

"This is why we have to get more people into racing. The more people who join racing, the harder it'll be to cancel it, if you will," he concluded.

"Certainly, the folks in attendance tonight heard about the RPM Act and SaveOurRacecars.com and what our goals are," summed up Deery. "From a broader sense, people learned that PRI is more than just a trade show. Whether it was the COVID restrictions or our work with the RPM Act, it shows our eyes are on the entire industry." PRI

PRI Associate Editor Laura Pitts contributed to this report.

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PRI's groundbreaking Road Tour is back, and this year our award-winning content creators are hitting the pavement—and dirt—at events and race tracks across the US. For this second edition of the Tour, PRI is visiting iconic venues like Pikes Peak in Colorado and Eldora Speedway in Ohio, as well as massive enthusiast and industry gatherings like Hot Rod Drag Week, Street Car Takeover, and the incomparable SEMA and PRI Shows. Over the course of six months our team will be documenting the experience through extraordinary footage, images and stories that you'll only find in PRI Magazine and our affiliated digital channels. Enjoy this second of a four-part pictorial series—and for all the latest news, images, video, and more from the Tour, visit **performanceracing.com/roadtour.**









SPECTATOR DRAGS

Berlin Raceway and Entertainment Complex in Marne, Michigan, is "Where Speed Belongs," so it's no wonder the PRI Road Tour added this unscheduled stop to the 2021 schedule. Ten minutes from Grand Rapids, Berlin Raceway has hosted quality competition since its first race season in 1951. Previously a dirt oval, officials converted the track to its current paved configuration back in 1966. The complex boasts one of the strongest local fan bases in the nation, having packed in thousands of spectators each year since its inception. Among its regular events, the 7/16-mile track plays host to a Spectator Drags and Autocross program—pure grassroots racing at its finest. These events, which are highlighted by autocross competition straight from the oval, offer free general admission and are designed to get both local racers and fans to the track—a track that also recently won the Advance Auto Parts "Advance My Track Challenge," where fan voting determines the winner among nearly two-dozen NASCAR-sanctioned short tracks across North America.



GREAT LAKES RALLY

Organized by Rally North America (RNA), the Great Lakes Rally combines the intensity of a time-speed-distance road rally with a 21st-century, Internet-enabled scavenger hunt. For this year's edition, ralliers started in Eau Claire, Wisconsin, with a visit to Rock Falls Raceway before covering nearly 1,300 miles across the Great Lakes region to GingerMan Raceway in South Haven, Michigan, the event's final stop. That's where the PRI Road Tour caught up with participants as they tackled the surprisingly challenging 2.14-mile, 11-corner road course. It's a blast for drivers who bring a spectrum of vehicles to run, from a last-generation Pontiac GTO to a current Porsche 911, with plenty of older sports cars and Detroit muscle, like a 1970 Plymouth AAR 'Cuda, to boot. Big-picture, RNA combines a love of the automotive lifestyle with a professional charity structure to do "good" through the automotive hobby. To date, RNA events have raised more than $1.4 million in direct donations to the charities it supports. The worthy charity for 2021's event is Race to Erase MS (Multiple Sclerosis).





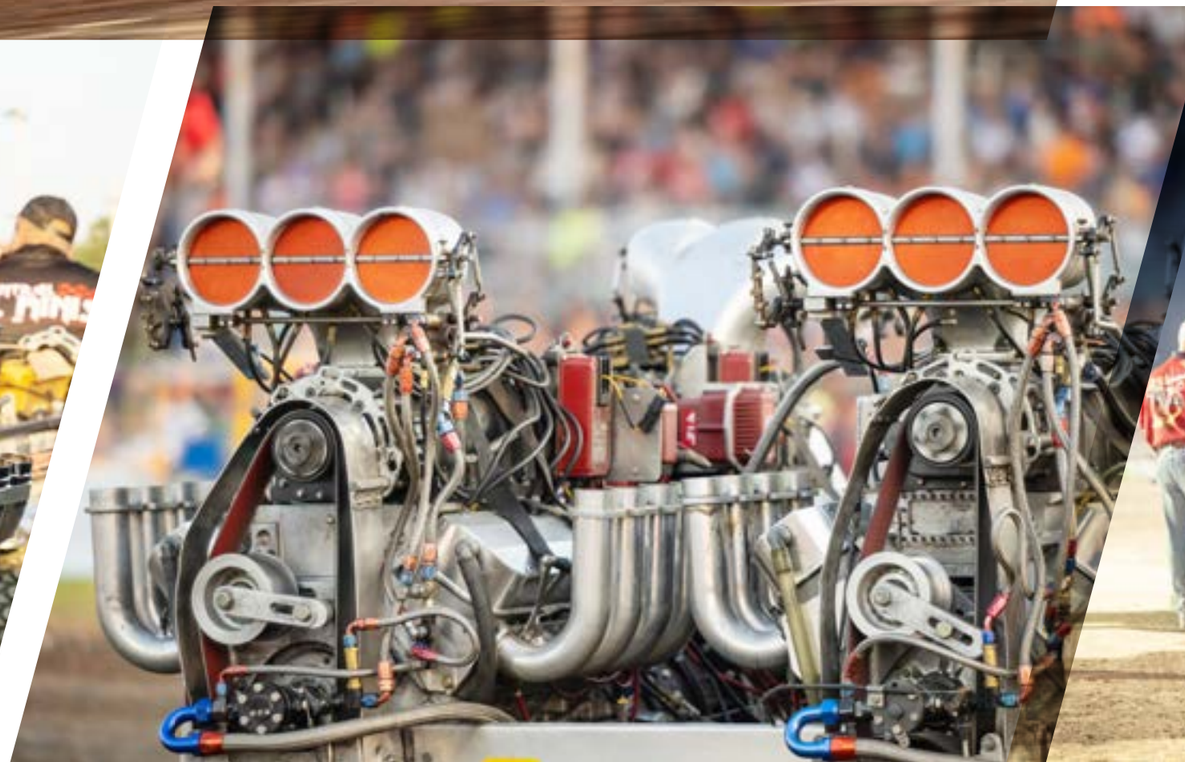
NMRA/NMCA POWER FESTIVAL

Not even intermittent summer downpours could stop the action at US 131 Motorsports Park in Martin, Michigan, where the PRI Road Tour found 500-plus race cars competing in heads-up and index categories during the annual NMRA/NMCA Power Festival. Hundreds of drivers from all over North America made thousands of total passes down "The Fastest Track in Michigan" over four days of competition in late July, which also included an impressive, all-domestic car show and manufacturer midway. Formally named the National Mustang Racers Association and National Muscle Car Association, both entities are owned by ProMedia Events & Publishing, which literally makes races happen by creating turnkey events based on great competition and family-oriented fun. This combination fosters a healthy commercial ecosystem that supports tracks, the surrounding communities, racers, and related businesses. The group has attracted major sponsorship packages from Holley, Ford, and others, and sponsored classes include names like VP Racing, Mickey Thompson, Edelbrock, Extreme Street, Richmond Gear, Exedy Racing Clutch, ARP, Detroit Locker, HP Tuners, and Whipple.

NTPA NATIONAL CHAMPIONSHIPS

Tractor pulling has deep roots in small-town America. The concept of harnessing modern horsepower to move a giant, weighted sled down a track continues to attract significant audiences both in person and on television. And it's what brought the PRI Road Tour to Wood County Fairgrounds in Bowling Green, Ohio, in late summer for the National Tractor Pullers Association (NTPA) National Championships. An estimated 80,000 fans came to see competitors chase down their share of the weekend's $250,000 in purse money and contingency prizes. Just like other forms of motorsports, the top-class rigs are impressive. Super Stock tractors can run diesel or alcohol and multiple turbochargers on big block engines. The Modified class ups the ante considerably by allowing up to four supercharged V8 automotive engines to propel a single tractor. But competitors also employ industrial or aircraft powerplants; the weekend's examples included a pair of 12-cylinder Allisons and a trio of turbines. Overall, more than a dozen divisions were represented in Bowling Green, where three Grand National champions were crowned. PRI







PRI 2021

NEVER STOP LEARNING

Stay informed of the changing business landscape by attending one of the many PRI Education seminars that will take place during the PRI Show in Indianapolis.

By Rex Roy

If it's your business to know the latest about airflow, valvetrains, suspensions or anything that has to do with making money in racing, you need to be at the PRI Trade Show this December 9–11, in Indianapolis, Indiana. In addition to all the new race-oriented products that will be on display, attendees can choose from more than two dozen Education Seminars taking place at the Indiana Convention Center.

Dan Schechner, PRI's Director of Education, stated, "Like we have for years, we're bringing experts to Indy to give PRI Members the best information on business, tech and our industry. This year, over three days, we're offering more sessions and covering more topics than ever before."

The following is a quick overview of the sessions. Seminars are organized into Business Track and Tech Track sessions. A complete course listing and registration information are available at performanceracing.com/trade-show/education.

BUSINESS SESSIONS

For those desiring to grow their businesses, there are several commonly shared concerns: growth strategies, marketing tactics and human resources. For 2021, PRI has a dozen individual sessions covering these topics and more.

Experts include content gurus, social media savants, and business and management consultants. Among them is business expert Tom Shay, who is coming back for his sixth PRI Show. Shay's two sessions are glibly titled, "Small Businesses Don't Die, They Just Make Too Many Mistakes!" and "You're Making Money, But Where's The Cash?"

Shay said he enjoys visiting Indianapolis because the city really rolls out the red carpet for the PRI Show. "My goal for 2021 is the same as any year: I want to have fun and help businesses put more money in their pockets."

Small business owners relate to and learn from Shay's keen understanding of business realties and human nature. For example, Shay said, "Business owners have told me, 'My employees can't be stealing. They've been with me forever.' And I tell them, 'Those employees could be stealing so much they can't afford to quit!'"

Business owners need to be aware of all types of enterprise pitfalls, even the ones they don't want to see. Anyone who runs a shop or a retail business will want to schedule time for Shay's seminars.

Presenter Chris Salem will cover brand and business building. Salem will address the importance of identifying and communicating the core value of a business in the session titled, "Building Your Brand and Your Business Simultaneously."

Brian Lewis and Jason Dodge each have sessions covering digital marketing. Lewis will focus on why every performance business needs to be on the web, while Dodge will discuss how to convert Internet search traffic into actual sales traffic. Just getting people to a business's website isn't enough to get them to buy. Dodge will explain the typical "customer journey" to maximize a business's online sales.

In his session "Competing for Quality: Hiring and Employee Retention," Ed Krow will help leaders learn to hire and keep the best employees.

Social media and content creation have emerged as the biggest marketing trends of the 21st century. While the "old ways" of advertising still exist (traditional TV, radio and print), a business won't likely reach today's mass audiences (and especially younger prospects) without a solid understanding of Facebook, Instagram and Google, as well as content marketing. Join Jennifer Cario in her two deep-dive sessions, "Facebook 2021: Build Your Reach Without Breaking The Bank," and "Instagram Reality Check."

Justin Cesler—a key member of the PRI Road Tour—titled his seminar, "WTF Is Content?!" The session will provide a practical, hands-on understanding of content and how to utilize various marketing channels to effectively reach customers.

Darin Morgan, BES Racing Engines

John Viscardo will host PRI's inaugural Social Influencer/Content Creation Panel of all-stars, who will share pro tips that can easily be applied to a business's marketing efforts. Panelists include Emily Williams from Flying Sparks Garage, sports reporter Jacklyn Drake, Alex Taylor of Alex Taylor Racing, HorsepowerMonster.com's Jeff Huneycutt and the aforementioned Justin Cesler from Driveline Studios.

Business authority Alex Striler is also leading two can't-miss sessions: "Sponsorship 101: How to Write Proposals that Sell!" and the "PRI Presidents' Panel." The former focuses on sponsorship fundamentals. "This year's seminar will help you understand why sponsors are sponsors, and what it takes to get their attention and their commitment," Striler said. "I've done this session multiple times, and it's typically standing-room only."

Striler's second session hosts an impressive panel of industry leaders including Kevin Miller, president/CEO of USAC; Julian Gill, CEO of Eibach Springs; Jesse Spungin, president/CEO of Mechanix Wear; Chris Dickerson, president/CEO of Horizon Hobby; and PRI's own president, Dr. Jamie Meyer. "The PRI Presidents' Panel will address current events and issues relevant to the business of racing and offer ideas on how members of the industry can collaborate to help motorsports grow," Striler explained.

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Also known as "Plumb Bob," the incomparable Bob Balderston will present a special session at PRI 2021 for retail operators rooted in decades of experience behind the counter...and several years of stand-up comedy.

PRI covers the RPM Act, legislative lobbying and Federal Executive Agency actions that impact the entirety of the performance and racing industry. The RPM Act and PRI's legislative efforts are helping ensure that our industry remains vibrant and protected by the government from the government. While the Presidents' Panel may touch on the RPM Act, there is a PRI session led by Daniel Ingber and David Goch that exclusively focuses on this important legislation and how racers and businesses can get involved.

Another important seminar is the "5th Annual Women in Motorsports Panel" hosted by Jeanette DesJardins from Car Chix and Crank It Media. Her esteemed guests include Hendrick Motorsports lead engineer and program manager Alba Colon, the duo of Ashley Chalk and Angela Ashmore from Chip Ganassi Racing, racer and stunt driver Collete Davis and drag racer Haley James.

TECHNOLOGY SESSIONS

Innovation, especially in racing, never stops. Incremental changes that net small gains in performance can make the difference between leading the pack or being a back-marker. This year, tech sessions are heavy into engine building with expert-led sessions covering airflow, EFI, bearings, fluids, valve springs and more.

Legendary engine builder Darin Morgan and Preston Mosher, BES Racing Engines' cylinder head department manager, are hosting "Air Speed in ICE and Bending the

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Car Chix founder Jeanette DesJardins, far left, will host this year's annual Women in Motorsports panel featuring Hendrick Motorsports' Alba Colon, racer/stunt driver Collete Davis, Chip Ganassi Racing's Ashley Chalk and Angela Ashmore, and drag racer Haley James.

Rules for More Power." This experienced pair will discuss the physical and regulatory rules governing induction systems and provide details about how to find the winning balance for a particular application.

In "3D Computer Flow Analysis Simulation of Performance Intake & Exhaust Port," Dan Agnew will provide information about how to understand intake and exhaust ports using Computational Fluid Dynamics. Chris Osborn will take things from the computer to the physical world with his session, "Racing Valve Spring Design and Development."

Because airflow doesn't mean a thing without some atomized fuel, Bob Morreale's session, "The Past, Present and Future of EFI Tuning" is critical for many racers and engine builders.

Meantime, MAHLE Aftermarket's Dan Begle will cover the design and fundamentals of performance engine bearings during his 90-minute session on opening day. Attendees will learn how race-specific components like rpm limiters, superchargers, and more affect bearing choices, and have the opportunity to ask questions of their own.

A special panel session will cover the lifeblood of any race car: fluids. The moderator is Driven Racing Oil's Kyle Fickler, and his panelists include Jason Rueckert of VP Racing Fuels, Total Seal's Lake Speed Jr., and Bill Alexander, also from Driven Racing Oil.

In his can't-miss tech seminar, Bob Morreale of The Tuning School will review how the industry progressed from early electronic fuel injection (EFI) to modern tuning for today's high-performance engines, and where the future of EFI tuning is headed.



REGISTER NOW

The PRI website has a section dedicated to Education and the sessions that will be offered December 9–11. View the full list at performanceracing.com/trade-show/education, where registration is also available. Every session and leader are listed, along with a synopsis of what will be covered.

Business leader Shay told PRI, "I can't wait to return to Indy. I look forward to PRI all year long. Of all the races, conferences, and trade shows I attend every year, PRI is by far the most productive, informative and fun." PRI

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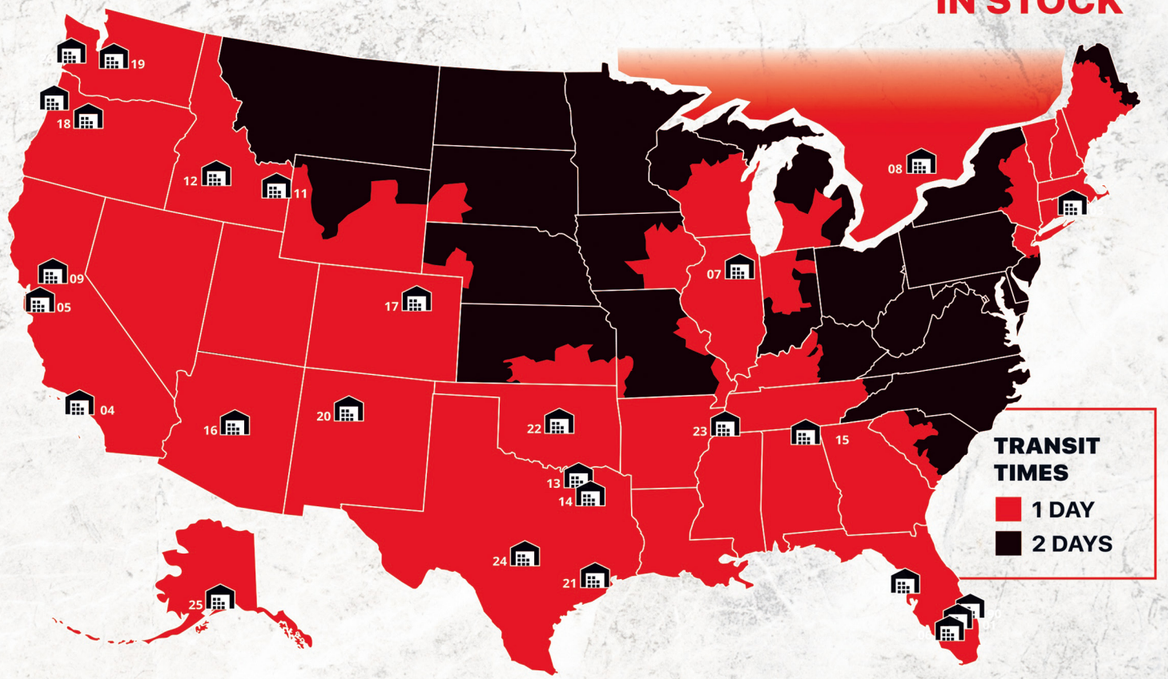

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PRI 2021

INNOVATION ON DISPLAY

New product introductions are the key attraction at the PRI Trade Show, so add these first-time exhibitors to your list of companies' booths to visit in December.

By Rex Roy



Motorsports constantly evolve and always innovate. Racers don't win by doing what they did last year. Yet it can be challenging to keep up with the latest products, services, and technologies.

That's why it's important for racers—and anyone involved in the racing industry—to make a point of attending the PRI Show, scheduled for December 9–11, at the Indiana Convention Center and Lucas Oil Stadium. Each year, the Show welcomes new exhibitors and their exciting products, and 2021 will be no exception. Many companies new to PRI are among the Show's confirmed lineup of approximately 1,000 exhibitors. These newcomers will showcase their offerings of race products, trailers, machinery, and simulation and testing technologies among the Show's 750,000 square feet of total exhibition space.

"Attendees can expect to see new products and innovative changes to existing products from our first-time exhibitors," said PRI Sales Director Celina Ingargiola.

Andrea Brake, another sales director on the PRI team, noted, "Long-time attendees can look forward to seeing new products and possibly finding a new supplier or customer. New exhibitors keep the PRI Show fresh and exciting, plus they're a great sign that our industry is heathy and growing."

Here are a few of the latest companies to join the line-up.

MORIMOTO LIGHTING

When it comes to performance automotive, lighting is probably not the first thing to come to mind. But Atlanta, Georgia-based Morimoto Lighting is out to change that.

Morimoto headlights improve nighttime safety by allowing racers and production-vehicle drivers to see farther down the road—and a wider view side-to-side—illuminating obstacles much sooner than with original-equipment headlights.

"We know that almost every single person who races owns a truck, either to race with or to haul their racing vehicle(s)," said Chris Nelson. "At Morimoto, we believe the truck that tows a racer's toys also needs some attention when it comes to safety, style and performance."

Truck lights aren't the only "bright idea" Morimoto is bringing to the Show. In addition to showcasing its entire product line of LED headlights, fog lights and taillights, it will unveil some new racing-specific products that are top secret until showtime. For a pre-show look at its products, visit morimotolighting.com.

FFP CUSTOMS

Pedal faster! That's the idea behind some of the products offered by FFP Custom Bolt and Go Parts.

Made in Dover, Florida, the Bolt and Go product line includes its Wireless LED Roll Bar Light Mount and Bolt On Oil Fill. But its innovative patented Bolt On Pedal Assembly enables quicker shifts for manual-transmission powertrains.

Although the pedal assembly was initially designed to be added at the factory, FFP Custom will demonstrate how DIYers can install it themselves.

In 2015, company owner Ryan Frazier began by working on other people's cars. When he couldn't find what he needed, he soon designed his own line of custom parts. In 2017, business was so good that Frazier devoted himself to creating and manufacturing innovative parts that customers didn't know they needed—until they found they couldn't race without them.

To see how simple the pedal kit installation is, FFP Custom will have a cut-away driver's compartment so attendees can try it for themselves, and then take a comfortable seat behind the wheel. Learn more at ffpcustoms.com.

SPRINGRITHM

Owners of chassis shops and service facilities know that a spring smasher can cost some two grand or more. It's no small investment, but a necessary piece of equipment—until now.

SpringRithm is an app designed to smash springs virtually using a cell phone or other mobile device. SpringRithm works by outputting measurements so the user can set springs to reach desired loads. It's designed for users who don't have access to a coilover testing machine or spring smasher, but still need dial-in coilovers correctly tuned.

"NEW EXHIBITORS KEEP THE PRI SHOW FRESH AND EXCITING, PLUS THEY'RE A GREAT SIGN THAT OUR INDUSTRY IS HEATHY AND GROWING."

SpringRithm outputs the dynamic loads that the springs will see in travel and tells how to preload the coilover nut to achieve the set load/loads. SpringRithm can handle single and stacked spring setups, with a bump stop analysis in the works.

According to company founder and creator Benny Boudreaux IV, SpringRithm has been in development for more than two years, and the final release is ready for use in the auto racing world. "Although we developed it with oval dirt racing in mind, SpringRithm can be used for a variety of performance vehicles," he said.

Curious? At the Show, SpringRithm will have a few iPads running the app and a spring smasher to compare results. (An Android version should be available by showtime.) Demos will include single spring setups, progressive stack setups, and digressive stacks. Visit the company's Facebook page, SpringRithm by B4 Unlimited, for demo videos and FAQs.



New exhibitors to the PRI Trade Show in December provide a fresh and different perspective with products not only for race vehicles, but for the shop, trailers, and tow vehicles, such as these accessories from Morimoto Lighting.

OHIO BRUSH WORKS

Since its founding in 2000, Delaware Paint Company of Plain City, Ohio, has focused on industrial, marine, protective and military coatings and applicators. Recently, it launched a new division, Ohio Brush Works, dedicated to designing and manufacturing quality auto paint brushes. As happened with many businesses that pushed to diversify their products in 2020, Ohio Brush Works found itself with the opportunity to develop a premier line of brushes for the auto industry.

"We think our auto brushes are the best-made brushes around," said Pete Newton. "We've designed them to be rugged and long-lasting and provide a smooth finish when applying paints and coatings. We are excited to share them with a new audience at the best racing show in the country." Ohio Brush Works will offer product giveaways and exclusive show discounts. Check out what the company has to offer at ohiobrushworks.com.



For diesel competitors in particular, Hart's Turbo will display its truck- and tractor-pulling turbochargers at PRI 2021, along with a newly expanded line of turbos for gasoline and street/strip applications.

HART'S TURBO

Fans of tractor or truck pulling know the Hart name. For more than 25 years, the company has been held in high regard for its performance tractor- and truck-pulling turbochargers, fuel injection pumps and injectors.

This year brought a new opportunity for this small-town business run by a father and two sons. They've founded a new division, Hart's Turbo, that brings their diesel performance expertise to aftermarket turbochargers for gasoline and street/strip applications.



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While at the PRI Trade Show, learn more about the unique and multi-purpose M1 Concourse, located at the north end of the famed Woodward Avenue in Pontiac, Michigan.

"We look forward to introducing the Hart name and the highest quality USA-made turbos in the world to a whole new audience of performance mavens," noted Roger Conley.

Booth visitors will get an up-close, hands-on view of Hart's newest car. To learn more about Hart pre-Show, visit hartsturbo.com.

M1 CONCOURSE

Michigan is the home of the M1 Concourse, a new and unique facility located at the north end of the famed Woodward Avenue in Pontiac. The M1 Concourse is perfect for vehicle and product reveals, as cars can be staged inside, then driven out onto the track for a demonstration.

"Events at the M1 Concourse are not static," said Tim McGrane. "Our 28,500-square-foot event center can host an elegant sit-down dinner for 350 or an outdoor event on the terrace for 2,500. Each event overlooks the Champion Motor Speedway, where guests can enjoy pit access and thrill rides around our 1.5-mile track. Event organizers can even hire one of our professional drivers to teach guests how to drive controlled laps behind the wheel of a performance vehicle."

Other amenities include a multi-purpose outdoor event arena with a 2.5-acre skid-pad and covered event spaces that can accommodate groups of 500. M1 Concourse also offers private garages, repair and restoration shops, and restaurants.

Take a look around the M1 Concourse at m1concourse.com.

VENGEANCE RACING

Ron Mowen, owner of Vengeance Racing (VR) of Cumming, Georgia, is no stranger to PRI. "We have provided display vehicles for various PRI exhibitors over the years and felt it was time we create our own display," he said. "We felt it would be an honor to be included in the PRI Show as an actual exhibitor. Quite honestly, we felt we were already doing 90% of the work required by providing and transporting Show vehicles for other exhibitors, but not reaping the benefit of being able to actually market our company and promote our brand."





Team Vengeance is coming to Indy specifically to showcase its latest in-house build and shop race car, a sixth-generation Corvette Z06 called Fatman 3.0. "This 3,500-hp C6 has a very special place in the hearts of us at VR," Mowen said, "and we have taken it to an entirely new level using the best manufacturers in our industry. We want to show off our capabilities as well as the quality products from our vendors."

Mowen clarified what he meant by "entirely new level:" Fatman 3.0 is a "3,500-hp twin turbo, billet block, full chassis, absolute perfect example of a C6 Z06 Corvette that should be making 3-second 1/8-mile passes by the time the PRI Show rolls around." Check out some of VR's other builds at vengeanceracing.net.

This longtime provider of display cars at the PRI Trade Show will have its own presence at December's event, as Vengeance Racing plans to showcase its latest in-house build and shop race car, a sixth generation Corvette Z06 known as Fatman 3.0.



READY FOR YOU

Indianapolis is ready to host the PRI Trade Show. Visit Indy, which serves as the Indianapolis convention bureau, has never let its guard down regarding COVID-19 with its sucessful protocols that have allowed the city to host major events—the entire 2021 NCAA Men's Division 1 college basketball tournament, including the Final Four, and the Indianapolis 500 to name just two.

The easy way to make hotel reservations for the Show is to book through Visit Indy, which also serves as the Show's only official housing partner. Seven new hotels and nearly 900 brand new hotel rooms will be available by showtime, allowing more motorsports professionals to stay downtown near the Indiana Convention Center and Lucas Oil Stadium.

One more thing: For the first time ever, all PRI Show attendees and exhibitors are invited to become PRI Members. Every level of membership, from the Pro Membership for individuals to the Founding Membership for corporations, unites us all to build, protect and promote our industry.

PRI's Ingargiola summed things up when she said, "The response for the 2021 PRI Show has been incredible! Between attendance and exhibitor registration, it's clear that the racing industry is ready to get back to business!" PRI

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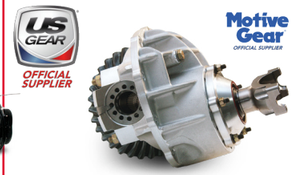

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SPECIAL REPORT

MANUFACTURER-DEALER RELATIONSHIPS

In these times of need-it-now instant gratification, seemingly endless virtual meetings, and COVID-related shortages, it's an old-fashioned personal touch that can often be the key to successful partnerships.

By Steve Statham



Parts manufacturers and dealers in the motorsports industry are joined at the hip, with the health of one affecting the health of the other. Sometimes that can be a turbulent ride, particularly during the past year, when material shortages, supply chain disruptions, and a cracked labor market have placed enormous strains on racing enterprises from coast to coast.

Pandemic conditions aside, the relationship between manufacturers and dealers has been evolving in a number of ways in the past few years. For one, the speed of business and the expectations for rapid delivery have only accelerated.

"The level of satisfaction that we have to provide now has to be right now," said Scott Neely of Cometic Gasket, Concord, Ohio. "People don't want to wait for anything. Everybody has become so accustomed to getting everything right now. If it's not in stock, they're just on to the next Google search result to find the parts. I would say there's a lot less patience in the marketplace than there used to be."

Of course, the speed with which the market now operates is not just a matter of demand, it is also a reflection of what is technologically possible today. Jeff Evers, also from Cometic Gasket, described how new systems have led to much quicker product development.

"Everything being data driven—ACES [Aftermarket Catalog Enhanced Standard] and PIES [Product Information Exchange Standard]—we've been working hard to get everything in those formats," Evers said. "We can produce a gasket, and within that same afternoon, once that first article is done and approved, we can get it on our websites, on our data feed, we can get our marketing department to take a picture of it, and it's all out there within an afternoon, compared to waiting a year cycle for a new catalog. That's just the way data has changed and information is distributed."

That type of manufacturer ability leads to opportunities for ambitious distributors. "Customers who request the ACES and PIES files then have access to all of your product," Neely added. "Somebody could have our file and build a website in an afternoon and be in business the next morning. Everything is just so much quicker and so much faster."

Another shift in the manufacturer/dealer relationship has seen makers of parts and sellers of parts tied more closely together, for a variety of reasons. "The relationships I have with many manufacturers has become more of a partnership in recent years," said Rich Willerton at Pegasus Auto Racing Supplies, New Berlin, Wisconsin. "In years past, dealings were more straightforward: This is what they have, this is what we want. Most interaction was a little back-and-forth trying to negotiate a better deal. Now there are more factors involved—shared marketing, product promotions, and customer referrals—which may have previously been nonexistent."

Part of that shift is due to the rise of distributors that specialize in very particular markets. “The evolution of the dealer relationship has changed to a much more targeted level of communication,” said Neely. “The quantity of niche customers has increased, and the number of broadly stocking distributors has decreased. The way you work with a customer today is much more focused on the specifics of the items and/or categories. Increased tech and application information is now more important than ever, and the ability to directly communicate that information is key. Increased product detail when releasing new products and applications is first, with all mechanisms of communication required. Electronic direct feed, social media, and in-person follow-up are the only ways to ensure that information gets consumed. ‘Sending an email’ doesn’t get it done, ‘putting it on the website’ doesn’t get it done. A full coverage effort is what is needed, and people dedicated to the task is key.”

Living, as we are, in the “information age,” the flow of that data is crucial to smooth relations between manufacturers and dealers. “From the manufacturer perspective, we are striving to have the tools available for the dealer to learn about our new products, or if we have updated any established part numbers, as quickly as possible,” said Thor Schroeder of Moroso Performance Products, Guilford, Connecticut. “We do this by having our company on a continual basis update the electronic data of our products and have it available for our customers’ use.”

Much of the detailed product information in past years was a kind of “inside baseball” that didn’t always filter to the racing grassroots. That’s not the case anymore. “I think there’s definitely been some evolution, particularly on the short track side of things, from manufacturer to dealer,” said Chris Dilbeck of PFC Brakes, Clover, South Carolina. “I know there has been for us, specifically. It just seems like years and years ago, some people would consider a distributor as just an order taker, to where they would just try to get their hands on onesies-twosies, whatever it was a customer may want. But now, a lot of the distributors are more tech savvy, and racers themselves are a lot more educated on the product.”

“EVERYBODY HAS BECOME SO ACCUSTOMED TO GETTING EVERYTHING RIGHT NOW. IF IT’S NOT IN STOCK, THEY’RE JUST ON TO THE NEXT GOOGLE SEARCH RESULT TO FIND THE PARTS.”



Manufacturer-dealer relationships are evolving, even while the pandemic strains supply chains like never before. Intensifying these challenges is a customer base that expects to receive parts almost immediately.

MANUFACTURERS’ OUTLOOK

There are varying perspectives from the manufacturers’ side on what makes for a good working relationship (and vice-versa, see below). Neely at Cometic Gasket likes to see commitment first and foremost. “There are plenty of effective ‘order takers’ in the automotive and performance aftermarket. Those willing to represent your brand by stocking inventory is the difference between ‘top of mind’ and ‘they asked for it,’” he said.

A dealer/distributor looking to provide “above and beyond” service will display “the willingness to spend the time needed to detail issues to solution,” Neely said. “If a problem or opportunity exists, telling your partner manufacturer about it is helpful. Willingness to support that effort with inventory commitment is even more so. Communication through sales and then tech departments is the best way to strengthen the manufacturer and dealer relationship.”

A regular part of PFC Brakes’ promotional efforts includes a PRI Trade Show special. The disruptions of 2020 were not as bad for PFC as they might have been, thanks to a number of dealers stepping up to the plate. “We still had a PRI special even though we didn’t have the Show last year,” Dilbeck said. “But our larger dealers still understood the importance of our end users. Car build season was coming with or without COVID. Our end users still needed parts, and so we had some distributors that still did their annual purchase volumes. We actually had a good year from our short-track grassroots market distributors. Our PRI discount was a part of that, but they rely on us heavily to give them forecasts and give them a pulse of the end-user market so that they know what kind of volumes to purchase from us.

“So we have a very good working relationship with our best distributors when it comes to giving them a heads-up on what we feel like they need to order. And there is a lot of trust there because they order it,” Dilbeck continued. “That is a dream distributor, one that you can, especially from a sales standpoint, say, ‘Hey, we’ve got these certain part numbers we’re seeing an uptick in, seeing some demand grow out in the marketplace, would you be willing to order X amount of these for us to be able to make a larger run?’ All of our best distributors always participate in those things.”







Moroso's Schroeder listed a number of things the company likes to see from distributors: "A dealer partner that holds their pricing on the product lines that they currently sell. Their reputation scores and how they are promoting their business either through content and/or on what social media platforms. Since we are an established company, we have to analyze how they would fit in with our other customers."

DEALERS' OUTLOOK

On the other side, dealers have certain criteria they use to judge the value of their relationships with manufacturers. For Willerton at Pegasus, the most important factor can be summed up in one word: "Responsiveness. On the dealer side, we deal with the end user, and they demand answers immediately. Many of those answers have to come from the manufacturer, and delays of days and even weeks can hurt the customer/dealer relationship, which in turn may harm the dealer/manufacturer relationship. As a buyer, I also have to be flexible with the manufacturer. Being willing to work around small mistakes and understanding delay issues, especially this past year, has strengthened relationships with many of my suppliers."

Willerton also noted the importance of face-to-face meetings when it comes to strengthening ties between Pegasus and the manufacturers it works with. "Providing marketing and training materials for our salespeople has become increasingly important the larger our company grows. In-house training visits from representatives gives us a first-hand interaction with new products that has become invaluable. Other services, such as shipping on our account or using our preferred method, show that a manufacturer is willing to do more to make a lasting partnership."

Jake Knowles is a racer who also runs Knowles Race Parts and Bodies in Rome, Georgia. For him, speed of shipping is critical when evaluating manufacturer performance. "Same-day shipping is always a plus. You know racers, they need it right now." But sometimes just the basics of having parts in stock is the key thing. "If they've got it there on the shelf and they can ship it out that day, that's a big plus."



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Manufacturers that sell directly to the public is a sensitive subject, as it can make life tougher for dealers. "My biggest pet peeve is to have to compete against a manufacturer," said Bernie Stuebgen of Indy Race Parts, Indianapolis, Indiana. "Some of them won't sell direct, and some of them do sell direct. Sometimes it's difficult to compete against the ones that sell direct. You often question yourself, 'Why do I stock their product?' Whenever I have to compete against them for the sale, sometimes they will ultimately undercut you and sell it at retail cheaper than what you're able to sell it for. That's, unfortunately, always been a struggle. There are a few manufacturers that stick out way more than others. That's just what you have to endure if you want to do this and be in it."

One way that manufacturers that sell direct try to minimize that impact is by only selling parts for full retail price to the general public, while allowing their dealers to sell at a discount off list through a Minimum Advertised Price (MAP) policy. That's how Cometic Gasket balances the competing interests.

"We have a MAP policy. If you have one, then you'd better enforce it," Neely said. "We've kind of run the gamut of using some outside agencies to enforce our MAP. But we find that our customers are some of our best enforcers. They will point out to us other customers that are undercutting or whatever.

"THE RELATIONSHIPS I HAVE WITH MANY MANUFACTURERS HAS BECOME MORE OF A PARTNERSHIP IN RECENT YEARS."

They'll send us links and screen grabs and everything else, and then we address it and confirm with the customer that it was handled. If you're going to have one, then you'd better enforce it, otherwise you're going to erode your product's profitability."

COMMON GROUND: THE RACE TRACK

Increasingly, shared experiences at the track lead to closer ties between manufacturers and dealers.

"I think it goes back to the manufacturer and how well they educate their distributor and their sales staff," explained Dilbeck. "But in a lot of cases, like our bigger distributors, they have sales guys who are racers, just like we are at PFC. They go out and try the



Suppliers such as PFC Brakes depend on the annual PRI Trade Show to strengthen relationships. To help make up for the canceled 2020 event, the company offered its Show Specials to customers anyway.

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products on their race cars. They know which ones are favored in certain arenas and know how to troubleshoot them. I feel like that has really helped us with our big distributors, just having knowledgeable sales staff as an extension of the PFC sales staff when it comes to distribution. That helps build that rapport between a manufacturer and a distributor, that common ground that we're going racing on a Saturday night, and they are, too. That just makes work a little more fun."

"If the manufacturer actually is in racing and not just works there, I think that helps a lot too, because they know more about what we're talking about," said Knowles. "If they need something, they would want it that quick, so they know that we need it."

For some distributors, parts won't get through the door until they've proven their worth on the race track. "I really only carry stuff that I would use myself," said Indy Race Parts' Stuebgen. "You can buy some stuff from here or there, but sometimes I just question the quality of their material or where it's manufactured."

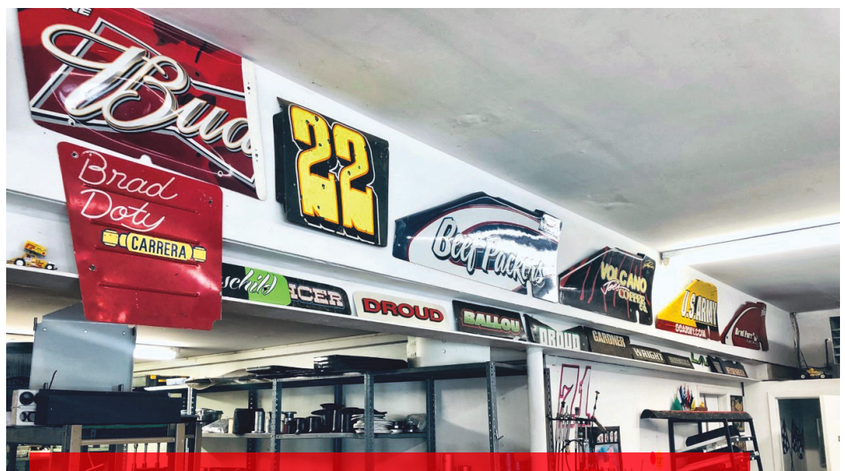
WHEN PROBLEMS ARISE

It's inevitable there will be conflicts between those who make parts and those who sell them. Cometic Gasket's Neely said that one way to diffuse them is with personal visits. "Having outside manufacturer reps who are in the field, able to bring these conversations up in a professional and structured way, allows us to prioritize the customer's needs by identifying what can be done with existing procedures and policies, and moving to any unique circumstance that cause us to be on different pages."

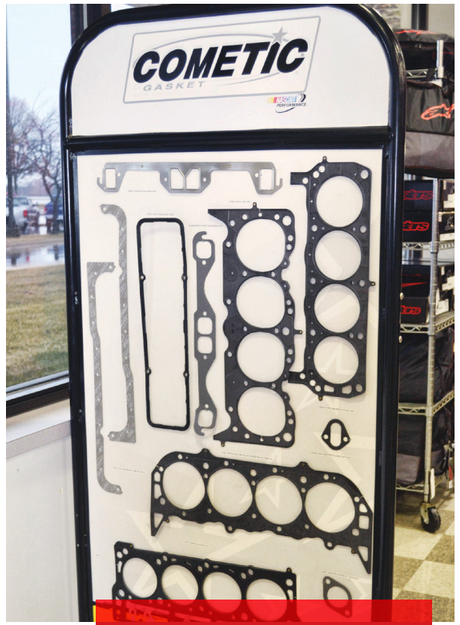
"Most of my manufacturers are willing to work with me but are not always able to comply with our company's needs," said Pegasus Auto Racing Supplies' Willerton. "By being understanding and flexible with my suppliers, I have built up a bit of prestige among some of them, which sometimes allows a few favors to be called in. Other situations may call for a little give-and-take. There are times however, that an agreement cannot be met, and you may have to find another source.

"In one instance," he continued, "a manufacturer had created some new products that they wanted us to push, which were not in line with our customers' needs. I had to respectfully decline and risk that this manufacturer would put an end to or greatly reduce the relationship we had built over the years. We still have that relationship, but the continued growth between us has slowed. I must add that the decision that was made has worked out better for us."

The pandemic continues to throw a wrench in the works when it comes to manufacturer/dealer relations. Stuebgen has seen relationships become more impersonal.



Racing experience and on-track performance are vital to building trust and respect. "I really only carry stuff that I would use myself," said our source at Indy Race Parts.



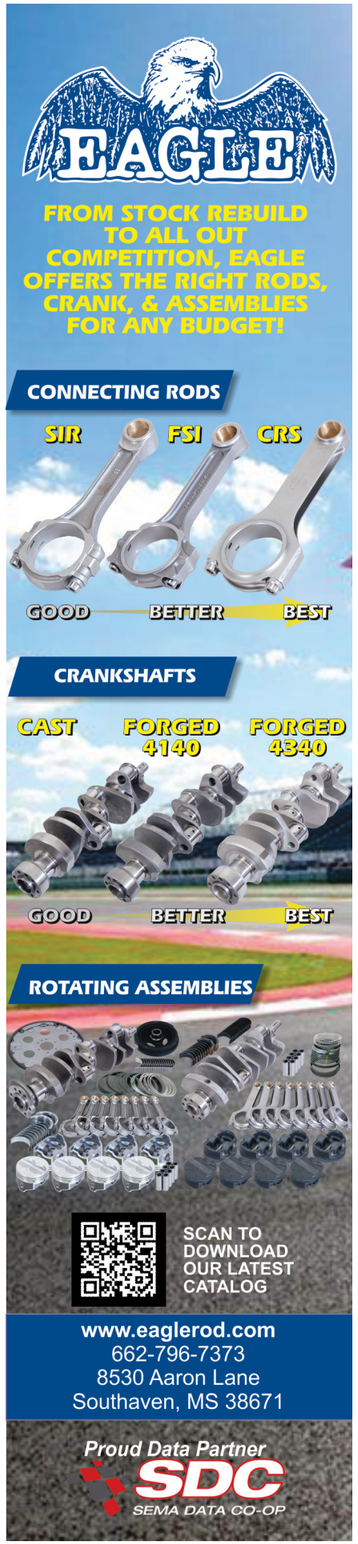
While much of the aftermarket has moved online, there's still a need for physical stores and reps to service them. "In our industry, people want to see people," noted our source at Cometic Gasket.

"I spend so much time of my day on the phone, I just get tired of being on the phone," he said. "So a lot of contact now, if I know certain people at certain places, I just text message people or email. Sometimes I go through Facebook Messenger or Twitter to reach out to somebody to order something. It's not the same as it used to be, where you'd just call up on the phone, or old-school, send a fax.

"Maybe some of it's COVID-related," Stuebgen added. "It is funny, since everybody wants to draw the 'COVID card,' that's just how some places are now. I chuckle because you call certain places, and nobody ever answers the phone. But you send an email and you get a response back in three minutes."

THE ROAD AHEAD

As 2022 approaches, the pandemic is still reshaping relations between manufacturers and dealers. But through it all, the basics of business haven't changed much.











"The old standards still apply when selecting a new source: quality, pricing, and delivery," said Willerton. "Currently, delivery of product has a greater emphasis compared to other factors. Supply chain issues have plagued many manufacturers, and the ability to provide the goods on a timely basis has been a major struggle.

"If most factors are equal, the ability and willingness of a manufacturer to work within your needs is a big plus in that final decision," Willerton added. "Even minor elements such as return policy, bonus discounts, and shipping flexibility show that a supplier is interested in more of a partnership than a transaction-based relationship."

The international aspect of so much of the motorsports industry is another factor that will continue to shape business relationships. "With most top manufacturers, our relationships have gotten closer and stronger," Willerton said. "There is a lot of competition between manufacturers, especially with overseas manufacturers having easier and greater access to dealers, and that has led many to contribute more to the relationship. Providing more service than just a transaction builds the relationship and helps those manufacturers and suppliers feel more like a partner with the dealers. The few that have become more impersonal have raised red flags about the financial state of their business. If they just don't care anymore, they are possibly on their way out of business."

What the post-pandemic landscape will look like is anybody's guess. Are the changes permanent or transitory? "I think it's probably going to take a year's cycle to see," said Cometic Gasket's Neely. "We went from doing a lot of open house shows and warehouse shows to virtual events."

Yet racing has always been more personal than that. "In our industry, people want to see people," Neely said. "They want to talk over a beer, they want to walk around the warehouse, check out everybody's products, they want to go to car shows and look at hot rods. It's a much more hands-on crowd. Sure, you save a lot of money with no travel, but the personal things suffer when you can't be in front of your customers, can't work directly with your customers at their facilities, can't do training seminars and those kinds of things. There's no way you can sit there



looking at a Zoom meeting or a PowerPoint and get the same interaction with customers as you can being in their facility, having a lunch brought in and going over all your different products. There's no way you're going to get that online." PRI

SOURCES

Cometic Gasket
cometic.com

Indy Race Parts
indyraceparts.com

Knowles Race Parts and Bodies
facebook.com/knowlesracepartsandbodies/

Moroso Performance Products
moroso.com

Pegasus Auto Racing Supplies
pegasusautoracing.com

PFC Brakes
pfcbrakes.com





CHARGING TO THE FRONT: EV RACING

With the auto industry on the road to EV transition, the racing community prepares for change.

By Jim Koscs

At the 2021 Summit Racing Equipment NHRA Nationals on June 26, the Ford Mustang Cobra Jet 1400 did a crowd-pleasing burnout, staged, and then carried its front wheels well past the tree on the way to an 8.12-second run at 171.97 mph. The only roar, though, came from the crowd. Driven by Top Fuel Funny Car pilot Bob Tasca III, the Mustang had broken its own quarter-mile record for full-bodied electric cars set earlier in the day.

The electric Mustang's record exhibition pass came just two months after the NHRA announced a new electric vehicle (EV) racing category for the 2022 NHRA Summit Racing Series. The sanctioning body's embrace of EVs and the Mustang's record were just two of a steady stream of EV developments to come from the performance and racing arena this year.

The day after the Cobra Jet 1400's record run, professional road racer and *Motor Trend* journalist Randy Pobst piloted the newly built Unplugged Performance Tesla Model S Plaid to 10th overall in the 99th Pikes Peak International Hill Climb, also winning the Exhibition class. The car, which used a totally stock triple-motor drivetrain making 1,020 horsepower, had track-modified suspension and aero pieces available for Teslas from Unplugged Performance. With the same Tesla, Pobst also ran a 1:28.21 lap at WeatherTech Raceway Laguna Seca, just 0.6-second behind the lap record for a production car that he had previously set in a $1 million internal-combustion-engine-powered McLaren Senna.

In off-road racing, the grueling Mint 400 in Nevada opened an EV class for this year's event in December, and Audi announced it would campaign an EV in the Dakar Rally in Saudi Arabia the following month. Since much of motorsports stems largely from connections to production vehicles—even if just visually—none of this should come as a surprise. Global carmakers, from mainstream to high-end luxury, had already announced goals and multi-billion-dollar investments to transition to EV-only production within about 15 years. Some have set even more ambitious goals than the White House announced in August.

While excitement for EVs is building in pockets of the racing community, at this point, nobody is calling for replacement of internal combustion engines (ICE) in motorsports. Instead, EV builders and racers, along with aftermarket suppliers and sanctioning bodies, are asking: How do EVs fit into our industry and sport? Where are the business opportunities? Who are the pioneers and innovators, and what challenges are they working to solve?

Here's a start on some answers.

NHRA PREPPING FOR EV DRAGS

The NHRA sees EVs as a growth opportunity. By working with OEMs, the organization plans to "remain on the forefront of all things performance," said Brad Gerber of the Glendora, California-based drag racing sanctioning organization.

Gerber confirmed that the NHRA has held individual and group calls with automakers, including Chevrolet, Ford, Kia, Toyota, and Dodge. An in-person meeting held at the Gainesville race in March gathered information from racers and other stakeholders, and more such meetings were scheduled.

"We want to get everybody going in the same direction," Gerber told PRI.

While EVs are currently legal to race in the NHRA, the new EV category announced for the 2022 Summit Series solidifies their place in the sport. Electric cars will compete in all seven NHRA Divisions, with a national champion crowned at the Dodge//SRT NHRA Nationals Presented by Pennzoil in Las Vegas, Nevada, before the 2022 SEMA Show.

Final rules for the new EV category are expected by late 2021, giving teams a chance to build cars. To help make that a little easier, modifications will be limited to suspension, wheels, and tires for their first year in the series. Gerber said the NHRA also wants to develop a specific EV class but had no details yet.

"EV is not replacing anything," he said. "It's an addition. The new EV category in the Summit Series is the easiest way to get this going at the grassroots level."



Electric race cars are going mainstream, thanks largely to projects like Ford's Mustang Cobra Jet 1400, an exhibition drag car that routinely clicks off low-8-second 1/4-mile ETs.

Each carmaker is at a different stage in its EV program, which is one of the challenges going forward, Gerber acknowledged. "For example, Ford wants to go in as fast as possible, while Toyota won't have an EV until 2024 or 2025."

Gerber said the NHRA wants the EV entries "to look like manufacturers' cars, but we also have to be concerned about their weight, speed and safety. For example, we need to know what the battery compartment looks like. How safe is it in a high-speed accident? We have to have plans in place for extricating the driver and dealing with fire if necessary."

Gerber suggested as one possibility a spec tube-frame chassis with a compartmentalized battery and using an OEM's EV system and body. "It could look like a Camaro, Mustang, Challenger, Supra, whatever it may be," he said. "This opens opportunities for manufacturers to do R&D in a safe environment."

Performance companies have expressed interest in contingency and sponsorship opportunities for the new class, Gerber confirmed.

"It's a relatively new industry with a lot of innovation going on, and people want to be on the forefront of that," he said. "We can put them on the forefront on a national level. We own our own production; we control the content."

MINT 400 OPENS TO EVs

Some of the most important new EVs coming down the pike are pickup trucks and SUVs, the heart of the US auto market. They'll now have a new venue to prove their mettle in off-road racing: The Mint 400 in Nevada launched a new EV class starting with this year's race in December.

Matt Martelli of Terranaut Media Group in Vista, California, which owns and manages the Mint 400, said the new class was created in response to requests from EV makers. It is open to all manufacturers and models, though there was no estimate of potential entries as of early August.

The annual race, which runs in some of the harshest conditions in the Mojave Desert, welcomes more than 400 race teams competing in everything from Class 11 stock VW Beetles to Trophy Trucks. Martelli believes EV trucks could fit right in, and that a brutal off-road race could be both an ideal proving ground and promotional opportunity for manufacturers.

"Off-road racing has a long history of embracing new technology," Martelli said. "It's a culture and sport, but it's also a business. We want OEMs, the aftermarket and suppliers and builders to come and be part of this. We want to make it a successful promotional platform for them and help new technology develop."

Martelli said more than a dozen companies expressed interest in the new EV class, but the new class was announced in the spring, leaving only about eight months to prepare an entry for this year's race. Importantly, he explained that the Mint 400 would require no changes to accommodate EVs.

"Our race is ideal for this," he said. "It has four 100-mile loops with a pit every 30 miles. So, whether EV teams need to recharge or swap batteries, we can allow for that. We've discussed with different companies having different time stops."

Martelli expressed confidence that the race could handle EV-related safety issues. "We're already using high-speed, high-density fuel towers, which probably require more for safety than lithium-ion," he said. "It's just a different protocol."

Consumer exposure will be critical for any EV racer's success as a promotional tool. Martelli said the Mint 400 fits the bill with more than 65,000 spectators over four days of racing. This includes a start/finish in Stateline, Nevada, plus remote spectating areas and the Mint 400 Off-Road Festival in Las Vegas.

Given the popularity of off-road racing, this will be a space for EV builders and aftermarket suppliers to follow closely.



EVs such as Teslas are eligible for SCCA solo competition, and the organization has formed a dedicated committee to integrate EVs into other SCCA events.

SCCA MAKES WAY FOR ELECTRIC SPORTS CARS

The Sports Car Club of America in Topeka, Kansas, which in the past sanctioned such legendary series as the Trans Am and Can-Am, is preparing to integrate EVs into the club's various programs. The club's recently formed Electrified Vehicle Advisory Committee (EVAC), which includes board liaison Dayle Frame and representatives from the different SCCA programs, is tasked with gathering information from tracks, racers and other stakeholders.

Only the club's Time Trials/Track Events section had been working with EVs to this point, according to Jon Krolewicz, who manages that program. Notably, it had already classed individual EVs, including Tesla, for Solo, in which drivers race individually against the clock. His section wrote a displacement-equivalency formula based on horsepower for an EV to compete with ICE cars and integrate them into ICE classes.

The thrust of the EVAC's work, Krolewicz explained, is unifying EV safety information and procedures across the club. "Once we have that, it becomes the platform from which a racing class can be started," he said.

Among the safety concerns tracks must address are driver extraction and fire suppression in a crash, according to Krolewicz. Lithium-ion is the most common battery chemistry for production cars, which is why the SCCA is focused on it.

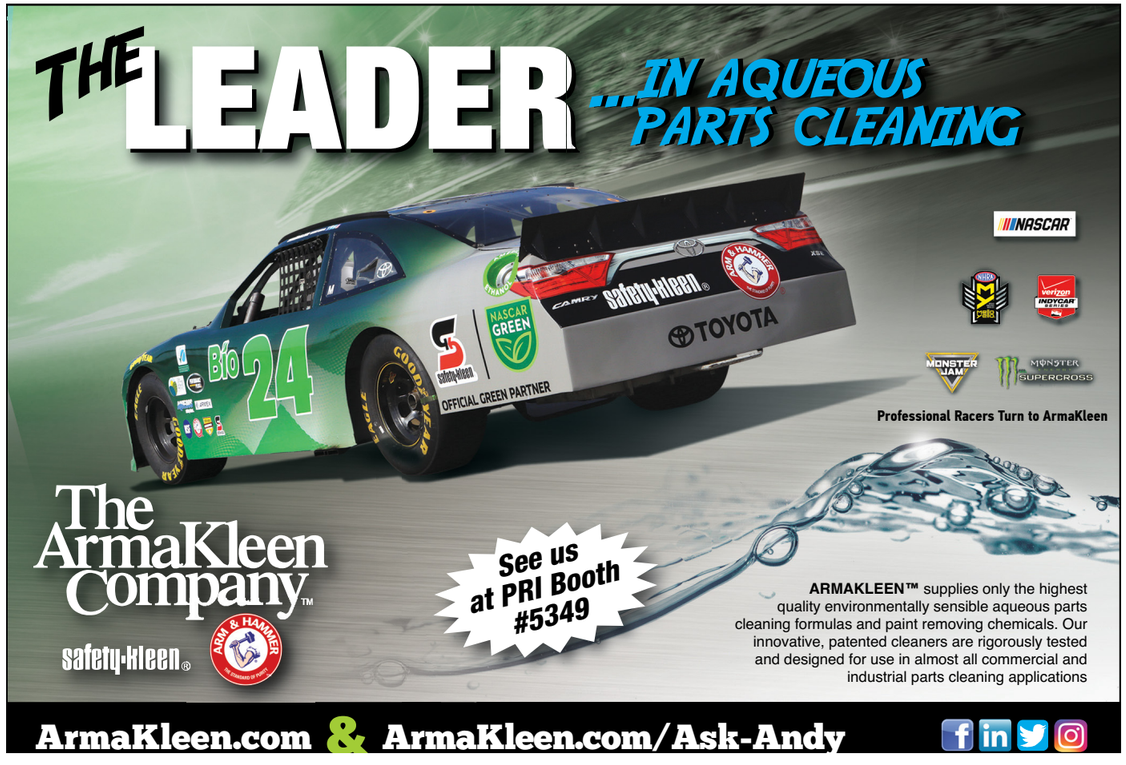
"The basic safety of a production car like a Tesla is vastly different than, for example, someone converting a Formula Ford to EV," Krolewicz said. "We need to create rules that allow both production and specially built EVs to run."

Because many SCCA drivers build their racers from well-used cars, the club is taking a long view when forming EV classes and rules. "There will be many more production EVs in the next few years, and we know that in five years, and most certainly 10 years, these will be very accessible to turn into club race cars," Krolewicz said.

Charging infrastructure is another challenge the SCCA is studying, and it could be an opportunity for the charging industry. Right now, a race team might need its own diesel generator to charge an EV, but Krolewicz anticipates that as EVs proliferate, tracks will be inquiring about greater charging needs. Battery swaps may become an option for specially built race cars, he said.

"That's more of a track issue, but it is a consideration for SCCA, because we can't put together a 30-car EV field and then find there isn't enough charging infrastructure for them," he said.

Finally, Krolewicz said the SCCA is encouraged by the interest expressed in EV racing from outside the club. "What has our attention is that aftermarket companies want to get onboard," he said.





The Pikes Peak International Hill Climb has emerged as a potent showcase for EVs; the current overall record is held by an EV, and Turn 14 Distribution sponsors a Tesla for the event. Photo courtesy of Turn 14 Distribution.

TURN 14 DISTRIBUTION GEARS UP FOR EV PARTS

The total number of EVs on the road right now is relatively small, and most are Teslas. That situation is evolving rapidly, however, opening business opportunities. Turn 14 Distribution in Horsham, Pennsylvania, has indicated its commitment to this growing market, including sponsorship of a Tesla Model 3 in last June's Pikes Peak International Hill Climb.

Dai Yoshihara, who won the Unlimited Division in the 2020 race in a Toyota 86, piloted the car to 51st place out of 54 finishers. (The course had been shortened from the normal 12.42 miles to 9 miles due to ice on the road near the top.) Other partners on the project included CSF Radiators, KW Suspension, Sparco, and Titan 7 Wheels.

"As a performance parts distributor, the connection to EVs is an important one for the future of the aftermarket industry and our business," Daryl Sampson of Turn 14 Distribution told PRI. "The long-term strategy is to bring attention to the EV market, announce our support for the market and our partners who are willing to be pioneers, and embrace it by producing parts for a segment that will only grow in coming years."

An EV already holds the overall record on the mountain: Romain Dumas covered the full course in the Volkswagen I.D. R Pikes Peak in a remarkable 7:57.148 in the 2018 event, more than 16 seconds faster than Sébastien Loeb achieved driving a Peugeot in 2013.

What kind of parts will sell for a car like the Tesla Model S, which offers up to 1,020 horsepower from the factory? There are already numerous aftermarket opportunities for EVs with chassis and body upgrades. Turn 14 Distribution last year provided a Tesla Model 3 to a carbon fiber manufacturer to develop parts for it, and the distributor is now exclusively offering the products, Sampson revealed.

"As a leader in the performance wholesale aftermarket distribution arena, we are certain that this is the future of the automotive landscape and have made the decision to embrace it," he said. "We've been in contact with our existing business partners to let them know that we are willing and ready to support, buy, and inventory products as they are developed for the market."

The Turn 14 Distribution-sponsored Tesla will be on display at the SEMA and PRI shows and various track events throughout Southern California.

ENTROPY RACING EVSR RACING PROGRAM GETS A RUNNING START IN SCCA

One SCCA competitor, Entropy Racing in Sacramento, Pennsylvania, has already been winning road-course bracket races against ICE cars in the club's Washington, DC and South Jersey Regions with its electric sports-racer, the EVSR.

"We are the only EV racing on real race tracks against gas cars," said Charlie Greenhaus.

Entropy's efforts with the EVSR demonstrate the viability and challenges of independently built EV race cars. The company has built four cars and currently has three more awaiting completion. Customers are renting and campaigning two cars, and EVSR plans to run the NASA 25 Hours of Thunderhill race in December using battery swaps.

Entropy Racing's EVSR road racer is unusual in that it competes on-track against gas cars. Since its debut in 2014, EVSRs have amassed approximately 20 victories.



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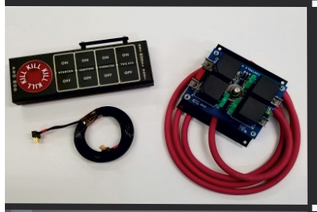

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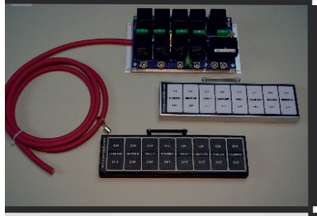

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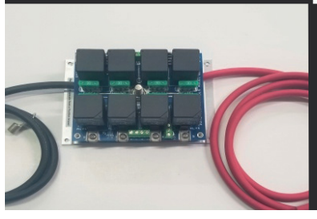

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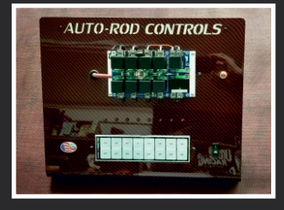

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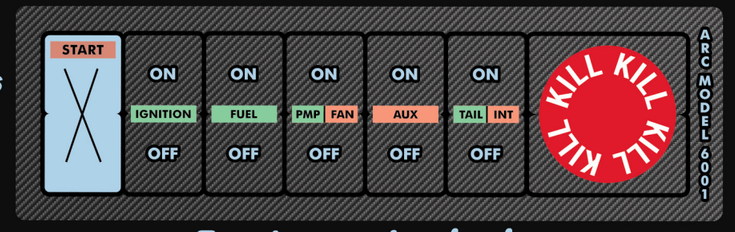

Model 6000 Not Shown Is Identical Except For Kill Button

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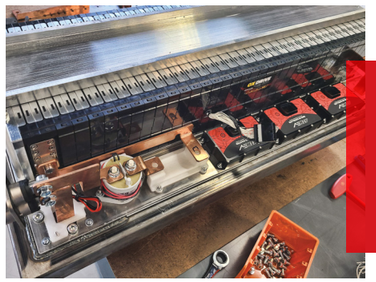
To help spread its message, Entropy/EVSR became the title sponsor for the EVSR Bracket Racing Championship Series running at Summit Point Motorsports Park in West Virginia. The series is open to cars from virtually any series, but as of early August, EVSR was the only electric entrant.

The first EVSR raced in 2014 and began winning against ICE cars immediately, according to Greenhaus, including beating a field of 18 Spec Racer Fords at New Jersey Motorsports Park. The EVSR team has since earned about 20 victories and numerous top-10 finishes.

Greenhaus described the EVSR setup as "simple," as "there's forklift equipment in our cars. These motors have been around for 15–20 years." The EVSR typically makes 170–180 hp. It can be pushed as high as 220 hp, or, if more range is needed, dialed back to 150 hp. "Tuning" is done by plugging the car into a laptop and adjusting EV system parameters, just as one might adjust mapping for an ICE. Typical top speed is 125 mph, though the car has reached 140 mph.



The EVSR's lithium-ferrous phosphate (LFP/LiFePO4) battery has been specified for any EV entrants coming into the series. It is less energy-dense than lithium-ion, but its 50 miles of range is more than enough for the 22–30 mile races in the series. Greenhaus describes its chemistry as "very stable" and able to handle impacts well and with easy and quick fire suppression.

EV racing's future popularity will depend largely on aftermarket support, such as Electric GT's eGT-913 Porsche system that converts 1969–1989 Porsche 911s to electric power.

He pointed out advantages over ICE race cars, including 40% less prep time. "We get the cars cleaned up, prepped, charged and ready for the next race and put them on the trucks. In the morning, it's just turn on and go racing," he said.

With no shifting for the direct-drive transmission and no driveline lash, the EVSR is said to perform very well in rain and go easier on its suspension than ICE cars. Also, there is very little powertrain maintenance.

Buying an EVSR outright would cost about $100,000, including charging equipment, according to Greenhaus. That's much higher than the $60,000 or so for a new race-prepped Spec Miata but can be a bit less than a BMW E46 M3. Getting a sponsor, Greenhaus said, could push the EVSR program to the next level.

ELECTRIC GT CONVERTING ICE INTO EV

Like every period in hot rodding and racing, the EV era has pioneers and innovators who push technology forward. Electric GT in Huntington Beach, California, is one example. The company started about five years ago with the conversion of a damaged 1978 Ferrari 308 GTS. The car raised eyebrows for both its audacity and its blazing performance compared to the original V8 model. Today, Electric GT offers conversion packages for a growing number of applications.

When PRI caught up with Electric GT partner Brock Winberg, the shop was converting a client's Porsche 911/934 RSR clone that had been vintage-raced and already had racing suspension. The owner, who also has two Teslas and cars built by Electric GT, plans to autocross the electrified Porsche.

A big driver in the conversion business is the availability of Tesla Large Drive Units from salvage cars. The "LDU" has essentially become the Chevy LS of the EV conversion world. This compact, sub-300-pound package integrates the motor, single-speed transmission, differential and inverter.

Winberg expects this trend to continue until other brands' EV motor units are available in significant numbers. "It always boils down to what is the most widely available and most supported by the aftermarket," he said. "Right now, that's Tesla. It's quite a lot of power for the money."

As with the Chevy LS, an ecosystem is growing around the Tesla technology. Electric GT uses controller units (VCUs) from AEM, which replace the Tesla logic board. The AEM system, co-developed with Cascadia Motion, can "recharacterize" the motor to boost output and other parameters. (The Mustang Cobra Jet 1400 uses the AEM technology.)

"AEM is really the first one to be doing this on an aftermarket level," Winberg said. "Its AEMcal software gets in there like HP Tuners do for a gas engine, and racers can play with the torque tables. It really opens up the tech-savvy tuning aspect. We're going to see a lot more of that in the industry."

Winberg explained that the Tesla LDU works most easily in cars that have independent rear suspension. "It's not undoable with a solid-axle rear, but it takes a whole lot more fabrication," he said. (Aftermarket IRS setups are available for some classic muscle cars.)

The Tesla Model 3 and Model Y use different technology than the Model S, and there are some challenges to using it, according to Winberg. "We're starting to experiment," he said. His bottom-line message to builders and aftermarket suppliers, though, is simple: "Don't miss out on this trend." PRI

SOURCES

Electric GT
electricgt.com

Entropy Racing
evsr.net

NHRA
nhra.com

SCCA
scca.com

Terranaut Media Group
themint400.com

Turn 14 Distribution
turn14.com



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HOW EVs WILL SHAPE *THE* FUTURE *OF* MOTORSPORTS SAFETY

Motorsports safety has primarily focused on internal-combustion vehicles. But with the growth of EV participation at every level of racing, these longstanding practices must evolve.

By Bradley Iger

The inherent dangers of auto racing have been romanticized since the first two motorized carriages in town lined up against one another. It's human nature to test our bravery and skill, to find joy in our successes in the face of peril. But thanks to a wide array of mechanical, technological and organizational changes implemented over the years, auto racing has become a far safer pursuit than it was even just a few decades ago.

Unfortunately, many of these advancements came as a result of incidents that revealed gaps in our knowledge about where potential deficiencies existed. As electric vehicles continue to find footing in motorsports, they're rewriting the rules not only in terms of performance, but also safety. With a fundamentally different design and fuel source, EVs pose new challenges for teams, sanctioning bodies and racing facilities, many of whom have just begun to venture into this territory with minimal outside guidance.

"You don't know what you don't know," noted Pete Fiset, a member of the International Council of Motorsport Sciences. "Right now, the industry is still figuring out a lot of this. Many of these different racing groups are taking their own approach to it and are creating their own solutions, but they're not always sharing that information with everyone else. It would be a shame for everyone to have to experience the same problems on their own before they too can figure out how to make things safer."

It's also clear that a better understanding of some fundamental concepts, best practices and what the future may hold will help lay the groundwork for a safer racing environment. As EVs expand their footprint beyond one-make series and production stock classes in racing, it's the sort of insight that will only become more valuable over time.

Photo courtesy of Ford

TAMING A DIFFERENT BEAST

Mike Hurst of the SFI Foundation in Poway, California, said that it's difficult to pinpoint specific best practices for EV safety in motorsports because trends (and standards they would necessitate) have not been established yet. But there are several key elements that are intrinsic to on-track electric vehicle safety as we know it today—as well as some inevitable challenges.

"For the majority of the programs we have, a lot of it would transfer over and be acceptable for use in an EV race car," Hurst explained. "And I think there's a parallel there if you look at, say, how local fire departments are equipping their staff and training for incident response with EVs. Many of the tools are the same. But much of EV motorsports in the US is still in the conceptual stage, and there are also things that we're going to need to do differently. Things like specific fire suppression agents and standardized powertrain controls that would oversee thermal limits and the amount of current. To me, that's going to be the toughest thing to manage. This is a safe propulsion system as long as OE-style controls are in place to provide safeguards against over-stressing the battery and things like that. But when put into a motorsport context, people are going to want to take everything to the limit. That's what racers do."

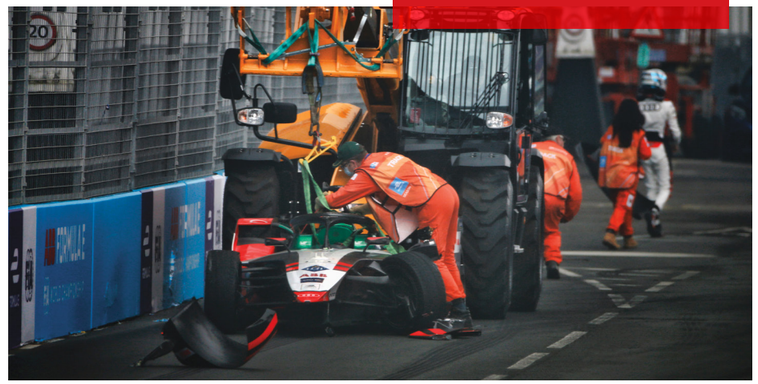


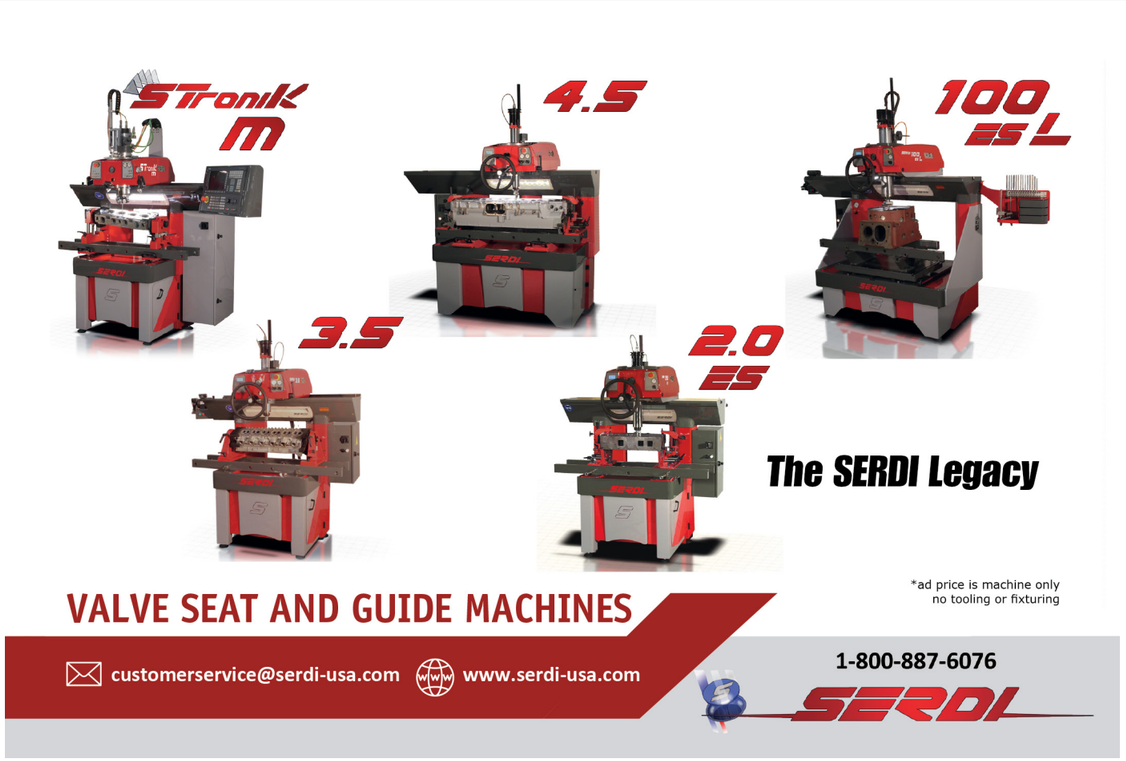
As EVs gain popularity on race tracks, organizations like the International Council of Motorsport Sciences are working to develop new safety protocols for them.

That presents issues that might not be detectable at a glance. "The dangers are usually obvious. You can see a fuel leak," said John Fabijanic, SAE Faculty Advisor at Cal Poly San Luis Obispo in California. "I'm fairly comfortable having my students handling gasoline. I'm usually more concerned about high-temperature fluids like coolant and oil. Those worry me more because people are generally less cognizant of how to handle them, and I would put electricity in that same boat. But SAE has done a good job establishing those basic rules in terms of how we isolate it down into low and high voltage and breaking it down into non-dangerous modules."

John Metric of the National Electric Drag Racing Association (NEDRA) in Houston, Texas, and owner of Lonestar EV Performance, said that while batteries are just another type of energy storage, their characteristics point to a change in procedure when it comes to incident response. "When ignited, liquid fuels are consumed very quickly. But a battery segregates electrons from one side of the accumulator to other side of it. As long as there's not some uncontrolled way for those electrons to get from one side to the other, they're fairly stable and safe. You could throw a match onto the battery and it's not going to spontaneously explode.

EVs present unique safety challenges. For that reason, course workers at events like this Formula E race proceed with extra caution when handling them.







Where we generally run into issues is with physical punctures of the battery, overheat conditions, and individual component failures inside the system. The reaction is more like a fuse burning—the fuel doesn't all go up at once. That typically provides time to evacuate the driver, and usually there's time to move the vehicle off the track as well. But if minutes go by without doing anything to contain it, that small fuse can set the whole vehicle on fire."

As Fiset explained, those fires can be much more difficult to extinguish than a blaze fueled by an internal-combustion vehicle. "Once thermal runaway sets in and the batteries catch fire, they can be very, very hard to put out," he said. "We are used to dealing with alcohol or petroleum-based fires, but these fires can become self-supporting. Just removing oxygen and hitting it with a CO2 extinguisher won't cut it sometimes. In some circumstances, these battery fires can require thousands of gallons of water to contain."

The technology is improving, though, and Fabijanic told us that improvements in controlling thermal runaway are already being seen throughout the industry. Yet when things do escalate to that level, those situations don't always line up with traditional best practices. "Those kinds of fires tend to run hot and release a lot of nasty chemicals, but the main issue is that they're internally sustained. So you need ventilation and, ideally, you'd smother it. With a lithium-ion fire, there's a kind of sand that contains specialized chemicals that are more effective at putting out those types of fires."

STRATEGIES FOR SUCCESS

Fabijanic also said that Formula 1, which incorporated a hybrid system into the race cars' power units in 2014, is one of the series that's leading the way in terms of protective equipment and operating procedures for EV technology in motorsports. "At this year's British Grand Prix, for instance, there was a big crash and there was a significant delay before they moved the car because they were confirming that the high voltage system was disabled. The safety crew had the thick, high-voltage gloves on as well. The issue was that there was still a green light lit up on the roll hoop of the car, which indicates that the hybrid system is active. So they went through a series of checks, and none of the normal corner workers touched the car until it was deemed safe. This is how Formula 1 is handling it, and other series are going to have to consider implementing similar measures as they bring in this technology."

Similar scrutiny should be applied to the designs of the race cars themselves. "DC current is always trying to find ground. Get between it and that ground and there's the potential for electrocution," Metric said. "The battery compartment and the driver's compartment should always be separate to prevent any high voltage around the driver.

"Since the early days, NEDRA rules have specified a master cut-off switch that's accessible by the driver as well as the track crew, so either one can disable the main power pack," he continued. "The battery pack should also be held down to the car in such a way that it's prevented from splitting apart and going in its own direction. Ultimately, you can plan for the worst, but wrapping yourself around a tree isn't part of anyone's plan. Fortunately, in drag racing you're not really faced with a significant potential for meeting a fixed object perpendicularly like that."



Electric vehicles tend to be heavier than traditional race cars. As a result, components designed for the latter may not directly translate to EVs. Photo courtesy of Lonestar EV Performance.

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With their lack of combustible fuels, EVs such as this Formula E car (in front of the Safety Car) are less prone to burning. But runaway EV batteries can trigger self-supporting fires that are difficult to extinguish.

Hurst said that the prospect of using motorsports components that were designed for traditional race cars on electric vehicles also comes with some additional considerations. "EVs tend to be heavier, and that might change what's going to work in a given application. A 4,500-pound vehicle is going to have a lot more crash energy than one that's 3,000 pounds. That also applies to things like wheels: Putting a traditional skinny drag wheel on the front of an EV that was intended for a car that weighs half as much could present a problem. It's a situation where the original manufacturer of the component just may not have envisioned that use case."

THE SHAPE OF THINGS TO COME

It's clear that at this early stage in EV motorsports' development, many of the rules and standards are still being written. Unlike the last century of automotive development, this is not a situation where gradual refinement has plotted a clear course for everyone involved. Instead, this is really more of a reinvention in the context of motorsports, and that means that finding the right solutions will inevitably require some experimentation.

"You know, part of this is about figuring out how to manage these on-track incidents safely without telling everyone they have to go home because there's a car burning up," Hurst said. "I saw a story about a mobile water tank solution they're trying in Germany, something you'd move around with a big truck. When they have a runaway thermal event with an electric car, they take that tank to the site, hook it to a fire hydrant to fill it up, and then drop the car in it. That might be a way to manage that. But then you have to consider that once that tank is filled, it's not going anywhere—it's just too heavy."

Fabijanic said that before long, that approach might not be necessary. "It used to be a situation where if you did something wrong, it was fairly easy to get these batteries to run away," he said. "But today's batteries are far more robust. You have to really mess them up to set them into a runaway condition. Advances in battery chemistry have played a big part in that, as well as the packaging strategies that are now being used to address thermal issues. We also understand a lot more about how to keep them cool today, which is good for both safety and performance."

Moreover, the wild card here isn't necessarily the technology itself. "If racers have the freedom to make changes, they're not going to take a conservative approach," Hurst said. "So the big question is whether this technology makes sense for grassroots racing. This is pretty sophisticated stuff, and you worry about the guy who's got just enough knowledge to be dangerous."

Yet there also needs to be a balance that allows for innovation and meaningful competition. "It's almost a marketing decision. Do we want people building their own cars at home and racing them, or are we trying to get unmodified cars out there?" Metric wondered. "If there's no tuning involved, I think the appeal is going to be limited. I also think that with most innovations, it's some sort of accident that leads to a rules change, and until there's a problem that necessitates a new approach, the electric program is kind of wide open. But from a sanctioning body perspective, if something can be shown to significantly improve the situation, I'm all for it."

Perhaps most importantly, with the financial backing and engineering resources of nearly the entire auto industry focused on EVs right now, they will continue to evolve at an incredibly rapid pace. "Eventually everything gets engineered to be safe, and innovations that are considered too expensive today might not be just a few years from now," said Fiset. "Five years is like a lifetime with this technology." PRI

SOURCES

International Council of Motorsport Sciences
icmsmotorsportsafety.org

National Electric Drag Racing Association
nedra.com

SAE
sae.org

SFI Foundation
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FUTURE PLANNING:

OEMs PLOTTING A PATH TOWARD EV RACING

Photo courtesy of Nissan

As regulations push production car design toward electrification, automakers across the globe are now looking at EV technology as a top priority for development. But what does it mean for the future of their racing programs?

By Bradley Iger

Over the past few years there's been a pronounced shift in focus across the automotive industry. While internal-combustion-powered vehicles have served as most brands' bread and butter for decades, looming fuel economy and emissions regulations are simply too strict to address by conventional means. That has led many companies to develop platforms that are purpose-built to support hybrid, plug-in hybrid, and pure EV powertrains.

Although motorsports has traditionally been a venue to develop cutting-edge technologies that may eventually find their way into production street cars, the nature of EVs has dictated somewhat the opposite approach at this early stage in its maturation. Current battery tech still limits the disciplines and formats where electric vehicles can be truly effective in racing, but those limitations are generally less of a concern with respect to the use-case of road-going vehicles.

Importantly, however, this shift also means that a massive amount of engineering muscle is now aimed squarely at these new platforms. As the OEMs continue down a path to increased electrification, here's a closer look at how EV racing fits into their larger strategy, and what that means for the collective future of motorsports.

NISSAN MOTORSPORTS

FRANKLIN, TENNESSEE

Nissan made its all-electric racing debut in the ABB FIA Formula E championship in 2018 for the series' fifth season, and the automaker wasted little time making its presence known on the grid. With driver Sebastien Buemi at the helm, the team took second place in the championship and secured six podiums, six pole positions, and 16 Super Pole qualifying appearances along the way.

Beyond brand awareness, the format of the series has also provided Nissan with an environment where the development of the race car correlates to the engineering behind the company's EV production cars. "For us, it's much more than motorsport," said Tommaso Volpe, Nissan's global motorsports director. "One of the main reasons we joined the series is because of this strong connection that we can make between Formula E and the core business. We came into the sport with a lot of experience in the electrification of road cars, and we transferred a lot of that experience into the development of the Formula E car."



Nissan's electric racing efforts currently focus on the ABB FIA Formula E championship, "a playground" for testing future EV technologies, said our source at Nissan.

Formula E no longer uses a 'spec' powertrain, unlike many electrified series currently operating today. "The chassis and bodywork are spec components, but it's a fully bespoke powertrain," Volpe explained. "That's why Formula E is the series that attracts the largest number of automakers as compared to any other motorsport. The money that we're spending in the development of the car is relevant to the core business, while spec elements—like the aerodynamics of a single-seater, which do not apply to the core business—are not things that we need to spend on."

This is incredibly important for Nissan, as the automaker plans to have a fully electrified road car portfolio in its key markets by 2030. "Formula E provides us with a playground to test this technology in a high-performance context," he said. "Along with the development of the powertrain components themselves, we're also developing the powertrain management software, which is equally important. The two most essential areas of R&D for us in Formula E are making the hardware as efficient as possible and making the energy management as sophisticated as it can be through the software. These two areas are key to developing successful platforms for vehicles like the Ariya, our first electric SUV. Developing the energy management software is crucial because it provides more flexibility in terms of applications for an EV powertrain."

Volpe told us that while Nissan is open to the idea of expanding into other series and motorsports disciplines with its EV technology, right now that strategy is largely being guided by series rule sets. "This is more of a function of motorsport in general," he explained. "The strategy for Nissan—and many other automakers—is to use prototype categories like Formula E to promote the brand and develop technologies. Looking at GT categories, this is where you tend to enter with your products. Here electrification isn't the driver, it's the product, so you're looking at the products in your portfolio that you can homologate and race in specific categories."

While Volpe wouldn't comment on the specifics of Nissan's plans for EVs in motorsports, he said that the experience that the automaker has gained in Formula E will allow the company to hit the ground running as it starts to venture into other series with the technology. "Some of it will depend on the homologation specs given by the sanctioning bodies, but the experience we're gaining in this series is valuable for any kind of electrification."

AUDI SPORT

NECKARSULM, GERMANY

Electrification in Audi's motorsports efforts dates back to 2012, when the automaker debuted a hybrid powertrain for its Le Mans program. Over the years, that system progressively evolved to play a larger role in the powertrain's overall performance, in turn pointing the way toward the EV system that would come a few years down the road.

"Throughout the latter period of our Le Mans program, the hybrid content in terms of the total amount of power increased," said Allan McNish, director of motorsports activities for Audi Group. "From there we moved into a complete battery electric vehicle when we stopped our Le Mans program and transitioned into Formula E. In much the same way most of our racing programs operate, it was a precursor to what we were developing on the road car side."

McNish noted that Audi's involvement in Formula E has not only provided a test bed for technologies that the automaker plans to put into production, it has also given the company a platform to change perceptions. "We were developing the system as well as the messaging. It allowed us to show customers what's coming. There's a dramatic shift happening for the customer right now, and for them to understand the benefits, they need to be able to see it in action. It's not just about getting from Point A to Point B. It can be exhilarating as well."







Audi's EV motorsports efforts began with its 2012 hybrid Le Mans car, then progressed to Formula E. Now, the Dakar Rally is the company's next EV-racing target.

Audi has already targeted the next motorsports venue where it will take its EVs. "We're transitioning out of Formula E and into the Dakar Rally, which is another step forward for our electric technology," said McNish. "Dakar is one of the toughest challenges that you can take on while looking at it as an all-electric drive. There will be a lot of learning and development in the beginning. It's definitely going to be different from what Audi has done before."

He explained that racing environments not only provide real data at the extremes, they also allow the automaker to compare that data with more traditional testing procedures to discover where further refinements can be made. "There are effectively two core parts to an EV strategy: the hardware, and the software development to maximize the hardware. The latter is where I think you'll see the big gains coming. Using Formula E as an example, at some race circuits we are now recuperating up to 40% of the energy used. Ten years ago, that was lost energy. A lot of this is about figuring out what these electric motors like and don't like in terms of where we're recuperating the energy, and how we can use that recuperation technology to also improve vehicle dynamics. We can also replicate these scenarios on dyno rigs and fully dynamic simulation systems, and we'll run the latter on race weekends. When we're racing in New York, our simulator is running back in Neuburg."

McNish sees a future for EV tech in rallycross as well as GT-class road racing. But as far as Audi's road map for EVs in motorsports is concerned, that path will ultimately be determined by the automaker's larger goals in the years ahead. "It depends on what opportunities there are. What's clear in our strategy is that it has to align with our priorities. Over the next few years, I think we're going to see a much broader range of championships for battery electric vehicles."

TOYOTA RACING DEVELOPMENT

COSTA MESA, CALIFORNIA

Although Toyota is not competing in a pure EV racing series right now, TRD President and General Manager David Wilson noted that the automaker has been focused on hybrid and EV technology for quite some time. "The development is much more advanced on the production side than it can be on the motorsport side right now. Toyota has more electrified vehicles on the road today than all other manufacturers combined. While we're not presently competing in an EV-based venue, you'd have a tough time identifying a top-tier motorsport discipline that isn't either presently using some form of electrification or considering a transition to some form of that. That's where we are right now. As one of three OEMs competing in NASCAR, for instance, we have been in regular conversations with the sanctioning body about where the sport goes, directionally. I'm quite confident that there's some form of electrification on the horizon there."

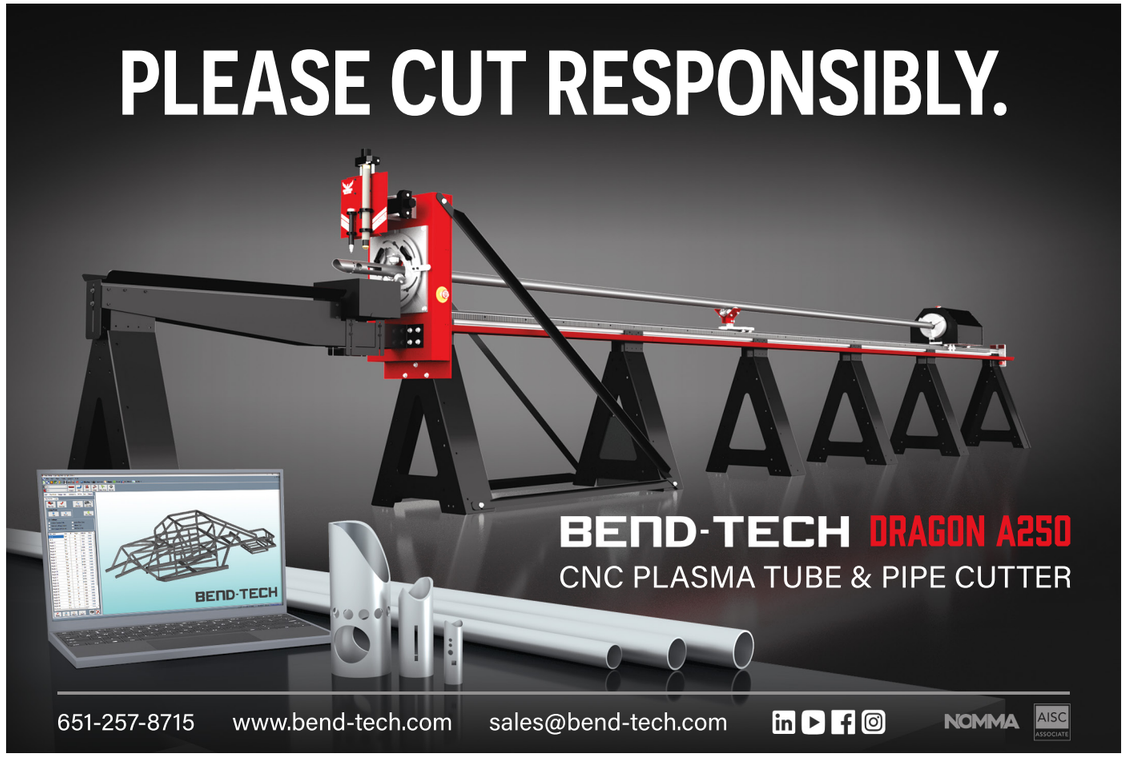
In the meantime, Toyota's continued involvement in LMH class racing in the FIA World Endurance Championship nurtures technological development as well. "This is a technology-driven class of racing, and there is a tangible component that feeds into the development of production car electrification with that effort."

Wilson also pointed out that Toyota is not exclusively focusing on one type of technology as a solution for emissions concerns. "We don't subscribe to 'one size fits all' thinking, and the hydrogen engine we're using in the Corolla Sport we're campaigning in the Super Taikyu endurance series in Japan is a good example of that. One of the big challenges is finding a path that will still captivate the fans. One of the benefits of this type of hydrogen technology is that, aside from the combustion of minute amounts of engine oil while driving, hydrogen engines emit zero CO2. Yet they still sound like traditional internal-combustion engines. So we feel that carbon-neutral motorsport solutions don't necessarily have to be mutually exclusive from the elements that fans get excited about."

He told us that motorsports continues to provide the company with an incredible platform to showcase these technologies, and TRD plans to take advantage of that. "Racing is a big part of sporting culture of America, and that provides us with a way to connect with a massive, passionate fanbase. With electrification, it allows us to engage with consumers and show them that it can be a technology that's deployed not just because it's socially responsible, but because it can deliver real performance."

Yet he said that these motorsports initiatives must align with the realities of the current market. "Series like NASCAR and IndyCar talk about staying relevant, but it's really about right-sizing the operational model. Teams cannot sustain the levels of money that they have been. There just isn't enough sponsorship to support it. So IndyCar is looking at a 'spec' bolt-on hybrid system, and whatever we come up with in NASCAR is likely to be of a similar ilk. The teams can't afford to get into that kind of arms race."





With that in mind, Wilson sees EVs' widespread integration into motorsports coming by way of hybridization first. "My pragmatic view of it is that the hybrid solutions make sense as a first step because they're far more attainable than a pure battery EV solution. In five years' time, I'd be shocked if every form of top-tier motorsports didn't employ some form of hybridization. It's almost like gravity at this point."

GENERAL MOTORS

DETROIT, MICHIGAN

GM has the notable distinction of being the first automaker to introduce a purpose-built and mass-produced electric vehicle. Although the concept may have been a bit ahead of its time when the EV1 hit the streets back in 1996, it gave the automaker a head start on its competitors as the technology began to take shape.

General Motors' eCOPO Camaro is a one-off testbed and demonstrator for the company's eCrate motor concept, an 800-hp electric motor assembly designed to be a bolt-in replacement for popular GM engines.



Development of its EV racing hardware is humming along nicely today, as evidenced by projects like the eCOPO Camaro, which uses a conventional drivetrain hooked to a pure-electric powerplant that generates 800 horsepower and 800 pound-feet of torque.

"General Motors has been known as crate specialists for internal combustion engines, so we wanted to kind of look forward and see how we could apply that same concept to powertrains of the future," said Russell O'Blenes, director of the performance and racing propulsion team at GM. "So we designed and built that motor and battery package to be a direct replacement for the engine in the car."

This year also marks GM's venture into off-road motorsports with an EV. "We're currently competing in the Extreme E series with our Hummer brand and Chip Ganassi Racing," O'Blenes explained. "It's a global off-road racing motorsports program, and it's been a great initiative for learning in the space. We really focus on using motorsports as a way to try new, innovative things so that we can then bring that technology back to our production components."



GM has paired with Chip Ganassi Racing to field this Hummer-branded EV racer in the inaugural 2021 Extreme E off-road series. "It's been a great initiative for learning," said our source at GM.

Outside of competition in series like Extreme E, GM also has dedicated locations where EV technology testing is ongoing and expanding. "We have our Performance and Racing Center in Pontiac, Michigan, which my team heads. As we're developing the new Charlotte Technical Center in North Carolina, we're looking at how we can tie in those testing facilities as well."

O'Blenes said that General Motors is also working closely with sanctioning bodies to determine where they see EVs fitting into their respective series. "It's about figuring out what the future opportunities are for electrification. We started with NHRA, but Chevrolet also has a major presence in IndyCar, and for the '24 season we'll be using a new engine with a hybrid system. We're working closely with them to see what kind of learnings can be had from the package. We have long partnerships with all of the sanctioning bodies, so we're trying to work with them and our partner manufacturers to get a better understanding of what the right places are for this technology, and how we execute it to make sure it's successful."

Although technological hurdles still exist—and recent supply chain shortages certainly haven't helped in that regard—it's clear that significant progress is being made to bring EV technology to a wider motorsports audience. "In motorsports and really everywhere in the EV realm, the battery technology and the hardware are rapidly evolving," O'Blenes added. "We're all working toward a common goal, and you can see results in series like Extreme E and Formula E. Because so many people are all working hard to go fast, we're making really good progress in this space." PRI

SOURCES

Audi Sport
audi.com

General Motors
gm.com

Nissan Motorsports
nismo.com

Toyota Racing Development
toyota.com/racing/trd

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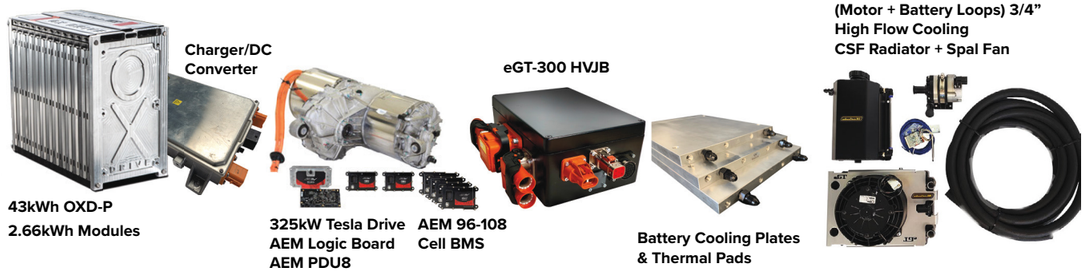

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MOTORSPORTS

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By John F. Katz

When friends Tony Kwan and Mike Chang founded Evasive Motorsports in 2002 as an early e-commerce website, "we were one of the few in the industry selling parts online," Kwan recalled. "I believe that's what gave us an advantage. Many people were already selling on eBay, but we believed it was important to grow our own site and drive traffic to our own platform. That was very important to growing our user base and creating customer loyalty. As online shopping grew in popularity, businesses that didn't adopt this sales channel began losing sales to those who did.

"We started really small, selling parts from home, mainly for Japanese cars," he continued. "At first we found our niche in small accessories—lug nuts and things like that. As we grew, we moved into a one-lift garage in Walnut, near Los Angeles. Now we had a place where we could stock parts that we thought were cool and that would sell. We tried to focus on the rarer items, parts that were harder to get, because we didn't want to be like everyone else. As we grew, we invested everything we made back into the business. We've moved five or six times since then." In March of this year, Evasive moved again, into an 18,000-square-foot facility in Cerritos, California.

While Evasive Motorsports has grown its physical plant, it has also built a knowledgeable, dedicated and enthusiastic staff, numbering between 20 and 22 as this was written. "We've been lucky to find great people," said Kwan, "and we've put together an amazing staff with good work ethics. We try to inspire our team members and help them grow individually. Everyone here is almost like family. I think that's why our turnover rate is so low."

Everyone on the team helps select parts for the catalog. "They are all very much in tune with the industry. They're hip, and they have good taste. So if any of them spots something that they think we should sell—something they think is going to be really hot—we will go ahead and get it. Mike and I can't take all the credit; we have a really good staff.

"We attract new customers mainly with our social media presence," Kwan continued. "And we keep them coming back by building cool projects and offering good advice, as well as the latest and greatest products."

THINKING YOUNG

Not surprisingly, Evasive's customers are young. "Most are probably between 18 and 35," said Kwan, "and the ones who are over 35 have been with us since the beginning." More significantly, "at least 50% of our customers take their cars to the track." So in addition to parts—still mainly for Japanese and European imports—Evasive Motorsports offers race preparation services, including wheel alignment, corner balancing, suspension installation and tuning, and general maintenance. "We've track-tested an extensive range of parts," Kwan added, "and we encourage our customers to call us for recommendations."

> *"WE TRY TO INSPIRE OUR TEAM MEMBERS AND HELP THEM GROW INDIVIDUALLY."*

You don't attract serious racing customers unless you race yourself. Here again, Evasive has been tuned from the start to its younger, import-focused audience. "We were one of the first companies in the US that participated in Time Attack," Kwan recalled. That was in the mid-2000s, when Time Attack was already popular in Japan, with significant support from Japanese tuning companies. "It was just starting to take off in the US," initially with exhibition races promoted by Japanese tuners. "Over time," said Kwan, Evasive's participation "helped us earn our 'street cred,' both within the US and globally. We even competed in a Time Attack event at Tsukuba Circuit in Japan, with a supercharged Scion FR-S that we built with backing from the manufacturer, and HKS as the title sponsor." The Evasive car lapped Tsukuba in 59 seconds, "where anything under one minute is a pretty big deal."

PEAK PERFORMANCE

When Kwan talks of building "cool projects," he means race cars. Among the coolest have been the cars Evasive Motorsports has built for the Pikes Peak International Hill Climb. Interestingly, Kwan sees the 156-turn, 12.2-mile ascent as "an evolution of our involvement in Time Attack. It's similar in that it's a time trial, but it's a much more grueling course and a more challenging environment." It's also a world-renowned event, where Evasive can not only "challenge ourselves" but also "compete with some of the greatest racers out there. Our marketing strategy is to show what we can do." Furthermore, when Evasive first faced the Peak in 2013, "there weren't many other tuning shops from our industry that were competing there."



Tony Kwan and Mike Chang founded Evasive Motorsports in 2002, selling small accessories online. They now command respect as a race-prep shop for international events like Pikes Peak.

Since then, the various Scion FR-S setups that Evasive has run up the mountain have become "cooler" every year. They started with an HKS supercharger, then turbo-boosted power on an original FA20 platform, which was eventually swapped out for a Toyota 2JZ straight six. After placing 11th in the Time Attack 1 Division in 2019, driver Dai Yoshihara returned in 2020 with the same purpose-built, 2JZ-powered Toyota 86, now fed by a larger turbocharger. But the Evasive effort would prove a nail-biter all the way. Practice was plagued by minor failures, and then a major drivetrain issue that required a new transmission. The car was not back together until 3 a.m. on the Saturday morning before the race on Sunday.

"WE WERE ONE OF THE FIRST COMPANIES IN THE US THAT PARTICIPATED IN TIME ATTACK."

Having failed to qualify, Yoshihara started last—just as the sky darkened and drizzle dampened the road. Despite a brush with a safety rail near the top of the course, Yoshihara finished 1st in the Unlimited division, and 9th overall, with a time of 10:11.446. "If he didn't clip that railing," Kwan observed, "he probably would have driven a sub-10. But we were very happy with the way things came out."

FROM RETAIL TO MANUFACTURING

In addition to its comprehensive catalog, Evasive now manufactures its own product line under the name EVS Tuning. "We started EVS four or five years ago," Kwan reported. "This has been a fulfilling venture for our team, as we get to design and create our own parts. We try to create products where we see a need for our customers. A lot of times when we're at the track, we see things that we think people could use."

For now, a lot of those parts are destined for Honda S2000s, whose owners comprise "a big chunk of our customer base. Aside from suspension parts, we have roll center adjusters, camber kits, and a roll bar." EVS also developed a carbon-fiber aero kit for the Civic Type R, because "at that time, nobody else had one. It was really successful. So we made a roll bar for the Type R as well.

"Another of our most popular parts right now is the GTLM aero mirror," he continued. "We designed and developed it from scratch, in-house. Once it was ready to go, we recruited high-quality manufacturers to mass produce the components. We assemble it in-house, and because the parts come from all over the world, there is less chance of anybody copying it."

Evasive Motorsports still focuses on the traditional Japanese and European cars it built its business on, but now the company is venturing into EV motorsports with efforts like this Tesla.



Most EVS manufacturing is contracted out—to whomever provides "the best-quality samples," said Kwan—although Evasive does make prototypes on its own CNC machine.

CUSTOMER REVIEWS

Like Kwan, Rodger Rivera grew up in the So-Cal universe of modified motoring. "We were running Subarus in the 1990s," Rivera told us. "Then I moved up to Seattle in 2001 and changed from lowered cars to rock crawling to lifted trucks, and then back to lowered cars. That was about 2003. I realized I didn't have any connections. So I reached out to a friend, who happened to be a friend of Tony, and now he provides all the parts on our cars."

"WE ATTRACT NEW CUSTOMERS MAINLY WITH OUR SOCIAL MEDIA PRESENCE. AND WE KEEP THEM COMING BACK BY BUILDING COOL PROJECTS AND OFFERING GOOD ADVICE, AS WELL AS THE LATEST AND GREATEST PRODUCTS."

The cars include a pair of WRX STi's: a 2017 for Rodger and a 2015 for his wife, Tara. Both run mostly HPD events. "Ninety percent of the aftermarket parts on both cars are from Evasive," said Rivera. "And I say 90%, because for tuning, I obviously have to use a local shop. If I still lived in California, I'd have Evasive do 100% of the work on the car."

Rivera is impressed by Evasive's "dedication to motorsports. It's not just the quality of the parts that they sell, it's that they test them in the cars they run on the track."









Evasive Motorsports recently began designing and manufacturing its own products, under the EVS Tuning name. "When we're at the track, we see things that we think people could use," said Tony Kwan. Seen here is engineer Kelvin Yong.

There's credibility—"weight" Rivera called it—to that. "You might spend a little more, but if you build it right the first time, you save money in the long run." He cited the example of a custom front bumper he purchased for his S2000. "Everybody knows that if you are working with aftermarket parts, chances are you're going to have to make some modifications." The part Kwan recommended cost $2,000 more than "some knock-offs, but he guaranteed it would fit. And, no kidding, when I got it from paint, I put it on the car, and everything matched up, 100% perfect."

When Rivera has had a problem, he's been impressed with Evasive's customer service. When an AutoPower roll bar that Tara needed—pronto—for an HPD event got bent during shipping, "Tony connected me directly to AutoPower and arranged for them to work with the shipping company so they could ship a replacement bar as soon as the claim cleared.



Owners Tony Kwan and Mike Chang credit Evasive Motorsports' success largely to its staff, who even help select the company's products, including chief technician Jason Reinholdt, seen here. "They're hip, and they have good taste," said Kwan about their team.

"Another time I ordered a pair of seats, and when they arrived the rails were a little too low, and my wife was a little too short, and she couldn't see. Tony asked me to ship the rails back, and he worked with me on a replacement—and on top of that gave me a great deal on a pair of Recaro seats.

"They are just great people to work with. And they're honest. They are not going to say, 'We'll get back to you tomorrow,' when they know they can't. They'll be up front and say, 'This is how long it's going to take, and if you want to wait, we'll be more than happy to do it for you.' We've been in the car scene since 1989, and we've never had such great customer service," Rivera concluded.

"They definitely go out of their way to make sure their customers are taken care of," agreed Michael Yeung of Honolulu, Hawaii. Yeung ordered a set of wheels from Evasive Motorsports 10 years ago, "and just went from there."

Yeung enjoys "tinkering with" his S2000. "It's supercharged, has all the aerodynamics, and a custom interior," he explained. Yeung has introduced friends to Evasive Motorsports and, while vacationing in Southern California some years ago, decided to drop in on the shop.

"I met Tony, and he showed me around. Ever since we've been friends. He's very knowledgeable, and if he doesn't know the answer, he'll go out of his way to find it. If anything is back-ordered, they keep me in the loop," Yeung concluded.

PLUGGED IN TO THE FUTURE

For its 2021 Pikes Peak effort, Evasive Motorsports built a super-lightweight Tesla Model 3. "Times are changing," observed Kwan, "and the EV market is constantly growing. We decided we needed to be a part of that movement.

"The car ran extremely well during practice with Dai driving, and we qualified second." On race day, however, electrical issues limited the Tesla's power, "so we didn't get the results we wanted." Yoshihara finished 8th in the Exhibition Division, with a time of 11:41.162.

"It was heartbreaking," said Kwan, "after all the work from our team and our sponsors. Thankfully, our sponsors still fully support us," and were happy with how well the campaign engaged potential customers. "We look forward to improving the build and returning even stronger next spring."

> "TIMES ARE CHANGING, AND THE EV MARKET IS CONSTANTLY GROWING. WE DECIDED WE NEEDED TO BE A PART OF THAT MOVEMENT."

Meanwhile, one of the latest products from EVS is a custom wheel for the Model 3, "as a way into the Tesla aftermarket. It's a flow-formed cast wheel, so it's stronger than a standard casting but costs less than a forging. We think we can sell it at a good price point for a 19-inch wheel."

Still, while Kwan foresees growing sales in the EV aftermarket, he emphasized that Evasive's involvement in electrification is "a long-term strategy. We definitely love and appreciate our petrol-powered cars. They are still our main business."

In the shorter term, Evasive Motorsports hoped to enter the Time Attack event scheduled with this year's Acura Grand Prix of Long Beach, which was in September. "In the future," Kwan added, "we would like to run an open-wheel series. To compete at that level would be an awesome experience for our staff.

"I think our customers will be rooting for us, having seen us come from grassroots racing, and evolving up to that." PRI







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A NEW TWIST IN CRANKSHAFT DEVELOPMENT

INNOVATIVE DESIGNS AND NEW APPLICATIONS ARE KEEPING MANUFACTURERS BUSY AS ENGINE BUILDERS AND OUTRAGEOUS BOOST LEVELS DEMAND MORE OF THE PRODUCT.

By Mike Magda



Crankshaft design is becoming more inclusive.

"Everybody wants something a little different," observed Nick Boes of Shaftech, Fostoria, Ohio. "Got a customer with a drag boat. It has a big block Ford crank with Hemi rod journals and a Chevrolet snout. We're getting more and more cranks like that where it's a conglomeration of a little bit of everything. Everybody wants their own little spin to make it a unique piece. But we can't stock stuff like that because we'd never get rid of the next one."

Boes doesn't manufacture crankshafts, but rather he repairs, modifies and applies finishes, so he sees the wide variety of crankshafts now peppering the market, especially because those selective racers may not be able to get a duplicate crankshaft for some time.

"They're all moving to one-off parts. When a guy hurts something like that and wants to order a crank now, they may say 16 weeks, but he'd be lucky if that's when he actually got it," said Boes.

Like most other sectors in the racing industry, crankshaft manufacturers stayed busy during the pandemic and often struggled with the same problematic issues of labor and parts shortages.

"Just getting trucks," added Matt Polena of K1 Technologies, Mentor, Ohio. "There's a lack of shipping trucks to get stuff from Point A to B."

"I was talking to a customer who had 32 motors on the floor and couldn't get enough parts to finish even one of them," agreed John Partridge of Bullet Cams, Olive Branch, Mississippi.

HOTTEST TRENDS

Despite some setbacks, new products are rolling out of the shops as more applications become popular or the crank manufacturers expand their catalogs.

"Howards did release both LS and big block Chevy billet cranks in our Reaper Series just before the pandemic shut everything down," noted Kirk Peters of Howards Cams, Oshkosh, Wisconsin. "We feel those two consumer markets had and currently have the biggest potential for market growth. Also, LS is the wave of the future and Howards plans on meeting those challenges with a better engineered product, such as machine center counterweight clearances so our cranks can be used in both stock and aftermarket blocks. The addition of center counterweights on both the LS and BBC cranks has increased the longevity of larger stroke crankshafts."

Center-counterweight or eight-counterweight crankshafts are certainly one of the hottest topics in the industry right now.

One of the hottest trends this year is the eight-counterweight or center-counterweight design.

"We're coming out with a new eight-counterweight billet LS crankshaft," said Tom Molnar of Molnar Technologies, Kentwood, Michigan.

"We are offering more center-counterweighted crankshafts than ever before. The first to roll out are Chevy big block with LS following," echoed Alan Davis of Eagle Specialty Products, Southaven, Mississippi. Conventional design cranks will also be on the forefront of company efforts, he said. "We are putting a lot of effort into developing a specific crankshaft for use in the RaceSaver sprint car series. We want to offer more than just a modified version of an off-the-shelf crankshaft. We want to not only reduce costs, but also improve performance and durability while staying within the RaceSaver rules."

Debate over choosing between a six- or eight-counterweight V8 crankshaft seems to focus on weight versus unwanted vibration.

"Center counterweights are implemented to reduce crankshaft flexing at extreme power and rpm levels," explained Davis. "This will also increase durability and fatigue strength. Racers are making more power than ever."

"A lot of people do not like the extra weight," countered Molnar, noting there are specific markets that truly need full counterweight designs. "The longer the stroke, the more there is a need for eight counterweights. Shorter strokes do not need them as badly."

Molnar pointed out that "counterweights will not necessarily improve performance but will improve longevity. You have forces pulling on all the rod pins. You need a counterweight opposite of those forces to reduce the bending. This is not about balancing, it is about reducing bending."

Engineers at Lunati in Olive Branch, Mississippi, agree with the benefits of the eight-counterweight design but have plans for an added twist. “The demand for an eight-counterweight is coming from hardcore racers,” said Will Vance. “It’s the same scenario we went through with the big block Chevy. Everyone figured out six counterweights were fine in a street application, but if you’re making any real power you can get too much crank whip. Now we’re seeing 450-cubic-inch LS engines turning over 7,500 rpm. Crank whip can be an issue with them.”

To help separate its crankshaft from the competition, Lunati plans to leverage its proprietary Black Magic finishing technology currently used on the company’s premium line of LS camshafts. The in-house coating adds hardness and smooths out the surface while leaving a unique black chrome appearance on the metal.

“The coating really improves the RA factor,” added Vance. “It fills in any imperfections left after machining. We’re looking at doing the same finish with crankshafts. It won’t make any more power, but it can improve longevity on the bearing ride area. If we can get this eight-counterweight crank going, it will probably be introduced with a play on the Black Magic brand.”

Another hot market for manufacturers is big diesel engines used for tractor pulling. Callies, which is based in Fostoria, Ohio, has released a billet crank designed for the International DT466 engine after a couple local racers brought in an aftermarket crank for a checkup. Engineers made a few design changes to strengthen Callies’ billet offering and are now talking with the racers to see if additional stroke is desired. This project opens up additional possibilities in a market in which the crankshafts can weigh up to 250 pounds.

“John Deere is probably one that we’ll do very soon,” revealed Brook Piper. “We’re going to go after the big cranks in the tractor market.”

On a more conventional note, Callies is developing a billet crank specifically for a billet block machined by Bullet Race Engineering in Australia that’s patterned after the Nissan RB30 platform.

“They’re targeting the Toyota 2JZ market down there,” added Piper.

Dirt late models running 4.500-inch-bore-center cylinder blocks make up another hot segment within the crank industry.

“We’re making a lot of crankshafts for those,” explained Peter Harris of Crower Cams, San Diego, California. “Those late models are very hard on parts. The harmonics going on in those engines can be really bad. We’ve had to make the cranks stronger.”

On the OEM side, new fuel economy and emissions standards are driving the development at Tier 1 supplier Pankl, which is based in Austria but also has operations in the US.

“Our customers have started to work on higher efficiency combustion engines, such as VCR [variable compression ratio] and opposed-piston concepts, which require a special crankshaft design,” said Christoph Wachmann.



Crankshaft design is getting more specialized as custom engine configurations proliferate and power reaches unprecedented levels. Photo courtesy of Eagle Specialty Products.

NEW DIRECTIONS

Much of the crankshaft industry has settled into a comfortable pace. Each manufacturer has its favorite steel, and while there may be different schools of thought on heat-treating, cranks are more durable than ever. Engine builders often have standard orders and don’t deviate from their favorite weights or journal sizes. They’ve experimented in the past but now know what works. and they’re happy with the results.

That doesn’t mean that risks can’t be taken. One of the livelier directions in the market is the flat-plane crankshaft. Other than Formula 1, flat-plane crankshafts have been tested but not well accepted into other racing venues. Among the reasons given was that engine builders were tired of chasing dampers around the dyno room because flat-plane cranks can be notorious for vibration issues.

“EVERYBODY WANTS SOMETHING A LITTLE DIFFERENT.”

Despite the challenges, there is still interest. Ford developed a flat-plane crankshaft for its 5.2-liter Voodoo engine found in the Mustang GT350 and GT350R programs.

“We are making more billet flat-plane crankshafts,” said Tom Lieb of Scat Crankshafts in Redondo Beach, California. “We’re making them for engines other than the Ford. Engine builders are finally getting onto the fact of what the flat-plane crank is all about. And the flat-plane crank is about using the exhaust system for tuning.”

Lieb said there are misconceptions about equal-length headers when using a conventional 90-degree crankshaft in a V8 engine. But with a 180-degree crank, equal-length headers will take advantage of the exhaust dynamics created as the cylinders fire 180 degree apart.

“You can adjust the length of the header, but to all four at the same time, and now you can use the exhaust to tune the intake,” suggested Lieb, adding that Ford worked out many of the vibration issues by using an up-down-up-down configuration for the rod-pin locations instead of an up-down-down-up configuration often used in other flat-plane applications.



Manufacturers are investing in equipment to pursue new applications and emerging markets, such as this crankshaft for pulling tractors. “We’re working diligently on adding capacity and flexibility through machining technology,” said our source at Callies Performance Products.

“That changed the balance of the firing order from side to side,” added Lieb. “This way it goes front-to-back, front-to-back to even the load across the crank and cuts the vibration.”

The debate continues, however.

“There are things that happen in a flat-plane crank that cannot be fixed,” warned Molnar. “You cannot fix some of the forces even though the crank is balanced correctly. Those engines shake. They might get some better performance, like in a Formula 1 car. But they basically tell the drivers, ‘If you don’t like the way the steering wheel vibrates, we’ll find somebody else.’”

No doubt that engine builders are demanding more of their crankshafts. Boes said the data acquisition on one of his customer’s tractor-pulling engines revealed the turbo boost peaked at 425 pounds during one pull.

“That’s a staggering number, when you think about it,” he said. “We’ve gotten a lot more requests to repair cranks. I think it’s twofold. Costs keep going up, so repairing becomes more feasible. Also, availability is getting to be a problem.”







"Big turbo, real high-horsepower drag racing applications seem to be the wave of the future," noted Harris. "Outlaw and no-prep racing. Some of those guys are making two-, three- and four-thousand horsepower. Trying to keep a crankshaft in there while it's trying to get pushed out the bottom of the block is pretty tough."

Increasing crankshaft strength often revives the billet versus forging debate.

"There's a place for both," said Peters. "If there's not a forging available, building a crankshaft from a solid round piece of material is the best way. It all comes to building a billet crankshaft when nothing else is available."

"There really is no debate, only a misinterpretation of design intent and manufacturing viability," affirmed Davis. "A forged part will be stronger than a billet part if there are no other differences dimensionally, material, or otherwise. I do think it is interesting that the automotive industry is the only industry that seems confused about this. Go anywhere else in any machinery-related industry and it's not even a topic anyone talks about. Why don't we have billet hand tools, for instance?



Although many in the industry have comfortable preferences regarding cranks, there's still some debate on issues such as materials and number of counterweights. Photo courtesy of Crower Cams & Equipment Co.

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- Made from Timken 4330 material.
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- Counterweights specifically designed per stroke to minimize crankshaft flex and whipping for optimal bearing load disbursement while minimizing overall weight.

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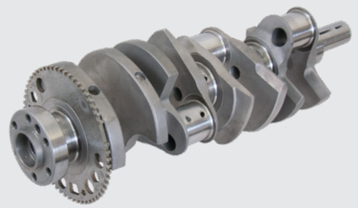

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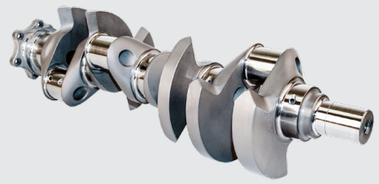

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LS WITH CENTER COUNTERWEIGHTS

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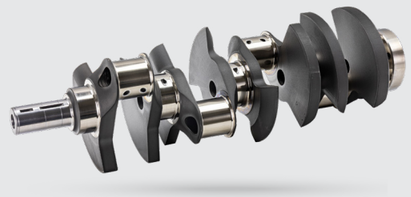

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- 24-tooth reluctor wheel (2005 and prior engines).
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- Throws lightened.
- Straight shot and chamfered oil holes.

"I think this all started because way back in the day, all anyone ever had were OE parts, and aftermarket forgings were not yet cost-effective," continued Davis. "Yet, a high-end racing crank would always be a billet one. OE forgings were only slightly better because the materials used were still not very strong compared to chromoly steels. I think the lofty reputation has just persisted through the years."

WHAT'S NEXT

Looking ahead, some crank suppliers are updating their manufacturing facilities and others are following advanced technologies, such as 3D printing. Callies and its sister company Energy Manufacturing will be bringing three new WFL multi-operation machines online in the near future.

THE DAMPER QUESTION

To run a damper or not. Sometimes that is the quiz of the week in racing garages.

Also referred to as a harmonic balancer, dampers are designed to reduce unwanted harmonics created when the crankshaft bends and twists under heavy loads. The automotive performance aftermarket offers four types to racers: viscous, pendulum, friction and elastomer. The manufacturers of each type have their loyal customers, as there are pros and cons to each design that engine builders weigh before selecting one for a particular application.

But there are racing classes where dampers are not used, and that's not always a good idea.

"We had an import racer who was really having a hard time with crank flex," recalled JC Beattie Jr. of ATI Performance Products, Baltimore, Maryland, the manufacturer of elastomer-style dampers. "He was not running a damper at the time. When he went on the two-step, the car would not sit still."

ATI suggested a damper package that worked. "Turns out the crank would flex so much that the back of the crank would bend and engage the clutch a little bit as it flexed, making the car creep forward," explained Beattie.

The damper industry seems to always be educating the customer on their product's benefits, including those racers who refuse to run them. They point to reduced wear on bearings and less risk of crankshaft failure, thereby reducing costs.

"Sprint cars and Formula 1—both rumored holdouts to damper integration—are currently using dampers or have used them," said Brian LeBarron of Fluidampr, Springville, New York, manufacturer of a viscous-style damper. "Fluidampr recently had great success with a small-diameter viscous damper on a Formula 1-inspired, 1,000-hp, 10,500-rpm, 396-cubic-inch V12 OEM production engine. The engine developer enclosed the damper within the timing case and used active oil cooling to achieve zero damper maintenance. In addition to the enclosed crankshaft damper, four camshaft viscous dampers were used to diminish torsional vibration effects in the valvetrain itself."

Sprint car engine builders have always worried about weight and packaging when trying to fit a damper in line with the water pump. Still, there are benefits.

"They are giving up horsepower, more peak rpm and the longevity of their engine and/or the components on it," added Beattie. "If you can't convince a racer that a few pounds will free up a lot of power, then I am not sure what will." —*Mike Magda*



Although some engine builders question the necessity of harmonic dampers, manufacturers say that just the increased longevity and reliability they provide is reason enough to run one.

"We're working diligently on adding capacity and flexibility through machining technology," said Piper. "One of the WFLs is a monster. It could also do a 40-inch diameter by 20-foot-long crankshaft. That gives us the capacity for longer applications."

"Additive manufacturing is already possible, but costs are high," said Wachmann. "The advantages will be lower weight with best stiffness and lubrication systems."

Market consolidation will be a factor in future development plans. K1 recently released a crankshaft for the Gen III Hemi, and sister company Dart Machinery is developing a Hemi block.

"In conjunction with our other brands we have been working on Gen III Hemi parts to complement the Dart block," said Polena, noting that matched rotating assemblies with K1 crank and rods and Wiseco pistons are productive for engine builders. "We have a couple of K1 rotating assemblies just for the LS platform, but we've been working on other applications, making sure all the fitments are right. It does take a lot of the guesswork out compared to trying to put together the parts individually from different brands."

Ford's Godzilla platform is also drawing attention at K1; otherwise, the ongoing directive is quality control.

"We're looking at keeping tighter tolerances on the crankshaft than what we're currently using," added Polena. "We don't have a crank yet for Godzilla, but we do have rods and have made some custom pistons."

On the custom side, Bullet continues to modify forgings to make them legal for Super Stock racing. One of the key adjustments is adding .015-inch stroke, which is legal under NHRA rules.



Flat-plane cranks are gaining popularity, largely because of the tuning possibilities they open up, according to our source at Scat Crankshafts.

"Normally we put in only .013-inch to give the customer some cushion," said Partridge. "Then we make them as light as we can within the rules, which means the counterweights cannot be undercut. You can't knife edge them, either, but we roll the leading edges over. And we can run any bearing diameter. It's usually a 283 Chevy for the mains and a Honda for the rods, but we can do any size they want. When we get through with them, they usually weigh around 40 to 42 pounds."



Manufacturers are increasingly asked to build cranks for engines that are "a conglomeration of a little bit of everything," noted our source at Shaftech.

"THIS IS NOT ABOUT BALANCING, IT IS ABOUT REDUCING BENDING."

Obtaining raw forgings is the priority at Bullet. The company first tries to find US forgings, then goes to overseas markets.

"We do all the work in-house to make them the way we want, as opposed to buying something already made and trying to reconfigure it," added Partridge. "It's a specialty crank, and not that many other people do it. It's so low volume that most others don't want to fool with it. For two of my workers, that's basically all they do."

Keeping up with demand will be the main priority for crankshaft suppliers, even as the racing season winds down. The winter months are always busy for engine builders, and they are understandably anxious about parts delivery.

"Some customers basically tell me, 'Just don't let me run out of crankshafts,' and I'm trying to get at least 20 in the shop at all times," noted Harris. "So, it's good business out there." PRI

SOURCES

ATI Performance Products
atiracing.com

Bullet Racing Cams
bulletcams.com

Callies Performance Products
callies.com

Crower Cams & Equipment Co.
crower.com

Eagle Specialty Products
eaglerod.com

Fluidampr
fluidampr.com

Howards Cams
howardscams.com

K1 Technologies
k1technologies.com

Lunati
lunatipower.com

Mile High Crankshafts
milehighcranks.com

Molnar Technologies
molnartechnologies.com

Pankl Racing Systems
pankl.com/en/

Scat Enterprises
scatcrankshafts.com

Shaftech
shaftech.com













Turning PIPE DREAMS Into Reality

NEW DEVELOPMENTS ARE PUTTING CUSTOM EXHAUST FABRICATION WITHIN REACH OF MORE IN THE RACING COMMUNITY, WITH BETTER RESULTS AND FASTER BUILD TIMES.

By David Bellm

Building headers can be like getting a root canal. It's one of those things you know you need to do, and you'll feel better when it's done. But getting through it can be a journey of patience, bravery and an impressive array of swear words.

Yet custom exhaust work is increasingly becoming a necessity, as potential car-and-engine combinations reach staggering numbers. "Engine swaps are becoming much more popular," noted Steve Zimmerman at Stainless Headers Mfg., Lake City, Minnesota. "There's more stuff in junkyards and more leftover frames sitting around. So engines are ending up in places they're not supposed to be. That makes finding an off-the-shelf header that much more difficult."

For the uninitiated, custom headers aren't what they perhaps appear to be. Although the tubes in a well-built custom header flow smoothly and evenly like bent pieces of tubing, they're actually in most cases formed from short, individual sections of tubing, welded together and then ground smooth.

It's not easy to do. But this age-old method of building custom headers is still the best way to come up with the complex bends typically required to fit headers in an engine compartment and keep the length of the tubes close to equal—an important element for optimizing the power and tuneability of an engine.

In other words, custom exhaust fabrication is more of an art than a science. But now there are new components, kits and tools to make the job easier. To learn more about these developments, we reached out to some of the leading suppliers of header components. They gave us valuable insight that can take much of the exhaustion out of exhaust fabrication.

SKILLED LABOR

Many of the suppliers we spoke to have moved away from building custom exhaust systems and instead focus mainly on selling components. "Custom fabrication work is very time consuming," noted Vince Roman of Burns Stainless, Costa Mesa, California. "It can be pretty expensive. The other part is, since we need to have the car, it has to be somebody who is close by or willing to ship us their car."

In most cases, then, racers seeking custom headers are left with two choices: Find a capable local fabricator or build it themselves.

None of our sources said outright that the process is beyond the abilities of DIY builders in a home garage. Nonetheless, some underscored the high level of skill the job requires. "Most of the customers that buy our individual components have made headers before," explained Jim Browning of Ultimate Headers, Berea, Ohio. "I equate it to watching home improvement shows on TV. They make it look easy, but those are professionals doing it day in and day out."

"It's not for the mild-mannered weekend warrior in his garage," added Roman.

That said, not all suppliers paint a dim picture for aspiring DIY header builders. Some even encourage customers to try it for themselves. “We get brand-new builders every single day and it’s great,” said Zimmerman. “We actually have a whole build series on our YouTube channel. When you break it down in the steps, it’s not a big deal at all for anybody who has a little bit of welding experience and has possibly done some light fab work.”

“We pretty well don’t stock any mild steel components,” added Roman. “There’s no reason to sell somebody something that will corrode away, when for a few dollars more we can get them something that’s going to last for a long time.”

Further enhancing stainless steel’s appeal for headers is the additional cost of coatings that mild steel requires to prevent corrosion and decay. “As coating costs are increasing, it becomes much more of a break-even point for stainless steel,” explained Zimmerman. “For instance, with a big block Chevy header kit we sell, the cost difference from mild steel to stainless is $275 to $325. When a guy goes to get his headers coated, whether it’s ceramic coating or just high-temp paint, he’s usually looking at about $250 to $300.”

“WHEN SOMEONE’S SPENDING THEIR HARD-EARNED MONEY ON A PERFORMANCE PRODUCT THAT’S THEIR PASSION, I THINK THAT’S WORTH A 10-MINUTE PHONE CALL TO FIND OUT WHAT THEY REALLY WANT AND NEED.”

MATERIAL ISSUES

There are essentially two choices for header material: mild steel and stainless steel. Mild steel was a popular choice for many years, and it’s still appealing to the DIY builders who may not have the necessary skills to work with stainless steel. Nonetheless, fabricators these days increasingly favor stainless steel for header construction. “It switched over about nine, ten years ago,” recalled Jim Renella of Performance Tube Bending, Irwindale, California. “Stainless got very affordable. Everything was mild steel before that.”

Some builders take sort of a hybrid approach to building custom headers, by forming a rough mockup out of mild steel and then turning it over to a fabricator to build the finished piece out of higher-grade materials. “We have a customer who’s building a Lamborghini Miura from scratch, powered by a Ford Coyote motor,” said Roman. “He built a mockup of his headers in mild steel.”



Burns Stainless “pretty well [doesn’t] stock any mild steel components,” a source told us. “There’s no reason to sell somebody something that will corrode away, when for a few dollars more we can get them something that’s going to last for a long time.”



Building headers is a complex geometry problem, where the need for gently curved, equal-length tubes collides with the real-world limitations of a car’s body and chassis.

Along with stainless steel, aluminum is being introduced for exhaust components. While it’s unsuitable for the brutal heat of headers, it’s starting to gain popularity for other exhaust system parts.

“In February or March of this year, we very quietly launched a bunch of undercar systems in aluminum,” said Zimmerman. “We’ve had enough of our customer base looking for something more lightweight that’s going to be better for race purposes, and aluminum was our solution. The weight difference is phenomenal. With mufflers it’s more than 40–45% lighter than stainless for the same design. And with tubing, you’re going to be 50–55% lighter with the same thickness on everything.”

The cost of Stainless Headers’ new aluminum components is said to be only about 10–15% more than equivalent stainless components. While the durability isn’t as good as stainless, for the most part it’s proving sturdy enough for weight-conscious competitors looking for an edge without resorting to pricier, more exotic materials. “Our initial concerns were that these mufflers and bends weren’t going to hold up,” said Zimmerman. “But we’ve had really good success stories from some of our earliest customers who’ve been running the same muffler in road racing and track cars for six months now without fail, which is better than expected.

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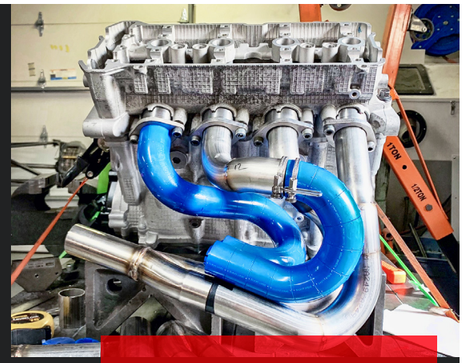
BUILDING HEADERS THE ICE WAY



The Header Modeling System from icengineworks speeds the process of creating header mockups, and helps fabricate accurate finished components from that model.

Before Victor Franco of icengineworks in Austin, Texas, came along, designing custom headers was a tedious trial-and-error process. "All the experts would tell me, it's essentially a Hail Mary," he said. "You had to waste a lot of material, and it would take months to design a quality system. So, I guess my assertion was, 'There's got to be an easier way.'"

Franco developed a system designed to take the pain and guesswork out of header design and allow quicker fabrication once the design is set. His product, the Header Modeling System, breaks the process into three separate stages: Stage I is design and modeling; Stage II is tube cutting; and Stage III is assembly and welding.

Stage I is the core of the system. It's a set of plastic blocks designed to enable builders to quickly and precisely mock up custom headers. Once users have snapped together their header mockup, markings on the blocks allow them to easily calculate bends and cuts.

"The plastic blocks are like Legos," explained Franco. "They snap into each other, and they're a faithful representation of actual bent tubing that's available. You don't have to go to a computer, turn it into a virtual design, and then have to come back to the real world. It's a faithful, one-to-one scale model. For example, if you're running a tube into a steering column, you're going to see it."

The blocks are available in three types: EH for exhaust headers; NP for turbocharger manifolds; and FE for full exhaust/cat back systems, intercooler and turbo downpipe tubing assemblies, and cold air intakes.

Stage II of the system is a method for cutting tubing precisely. It includes a fixture designed to transfer the measurements and angles quickly and easily from the mockup for faster fabrication.

Stage III is a unique clamp designed to hold tubing in place for tack welding. It aims to eliminate small positioning errors that can add up to big inaccuracies and wasted pieces when compounded over the length of a whole header.

At around $1,000 or more, the Header Modeling System probably wouldn't be a casual investment for some shops. Franco explained that the cost of building a product like this in relatively small production runs does not allow a lower price point.

Yet the system's cost justification is compelling, nonetheless. "I had one customer tell me that it brings a 40-hour job down to as little as 10 hours," said Vince Roman of Burns Stainless, Costa Mesa, California, a retailer of the product.

With welding and fabrication shop rates now typically at least $75 per hour, a 30-hour savings like that would pay back more than double the cost of the Header Modeling System.

Franco has seen the pain of building custom headers the old-fashioned way. Now he's a man on a mission to speed the process and make it more accessible for people of all skill levels. "There was a guy I met who was very proud of the header designs he did for a Fiero. It took him three months. Well, three months at two hours a day? You're nuts. Unfortunately, that's the best he could do.

"I tell people, if that isn't worth $1,000 forever, then you are in the wrong career, man." *—David Bellm*

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"We've even done a couple of merge collectors in aluminum, and bullhorn systems for some of these all-out drag guys," he added. "There's some Pro Mod stuff where they really don't mind replacing it every other weekend. So for us, aluminum is a great middle ground on getting something lightweight without breaking the bank, like swapping over to titanium."

However, any discussion of materials these days would be incomplete without mentioning the effects of the pandemic. With international supply chains battered by COVID-19-related factors, header component manufacturers are sometimes forced to delay orders, put shipments on hold or offer customers alternatives for the time being.

Nonetheless, some suppliers have been able to cope better than others. "I had an inkling about this a few months ago so I ordered a lot of inventory," said Renella. "I'm getting a mill run ready for stainless steel tubing, and I'm willing to place a big order with money upfront."

COMPLETING THE PUZZLE

Another important consideration for fabricators building custom headers is the question of what specific components to order.

A custom header is essentially a jigsaw puzzle without a picture on the box, forcing fabricators to order the correct type and quantity of tubing bends, collectors, flanges and other hardware before they even know exactly what they are going to need.

> *"ALUMINUM IS A GREAT MIDDLE GROUND ON GETTING SOMETHING LIGHTWEIGHT WITHOUT BREAKING THE BANK, LIKE SWAPPING OVER TO TITANIUM."*

To help customers get all the right pieces for their project, Burns Stainless offers a Race Engine Spec Form on its website. Users fill out the online form with information about their engine, car, exhaust system and type of racing. From those details, Burns then works up a custom list of components the builder needs to order.

Other suppliers favor a more organic approach to understanding customers' needs. "I think it's important to have a conversation with customers," said Browning. "When someone's spending their hard-earned money on a performance product that's their passion, I think that's worth a 10-minute phone call to find out what they really want and need."

Browning said he asks customers about the kind of engine they're using, the make and model of vehicle, whether it's a factory chassis or custom unit, engine placement in the chassis and more. Along with this, he'll frequently have customers text or email photos of their setup to get an even clearer idea of their needs.

To further aid fabricators in their header-building efforts, some component suppliers offer kits. They typically include flanges, collectors and an assortment of tubing bends. Some kits also add other extras to accommodate a wider range of potential applications. Kits from Stainless Headers, for example, have collector tabs, oxygen-sensor bungs and even a supply of TIG-welding filler rod. "It's basically missing only the welder," said Zimmerman.

Some suppliers have developed their own unique hardware, designed to further simplify the build process and allow more options for fabricators. Ultimate Headers offers cast elbows that have very tight bends, which allows headers to sit closer to the engine by making the first bend in the system a smaller radius than is possible with bending.

"Because of that cast elbow, we're able to engineer and manufacture headers that have big tubes and make them fit in tighter places that aren't easy to do," explained Browning. "It flows extremely well. You're not cutting a tube in the middle of a bend, where you've now made it more egg shaped."

THE BACK END

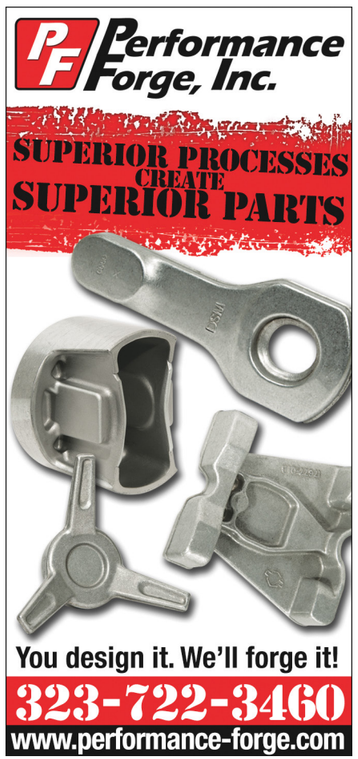
Although many race cars don't need an exhaust system beyond their headers, mufflers and full exhaust systems are increasingly becoming a reality for some, particularly on tracks with aggressive noise regulations. For dual-purpose cars, a full exhaust system is pretty much a given.

As with header building, there are a number of kits available for exhaust system fabrication. These typically include pipes, mufflers, flanges, connectors and clamps, built from aluminized mild steel or stainless steel.



Prefabricated header components like these double-slip collectors from Burns Stainless can shorten fabrication time and dramatically improve the quality of custom headers.













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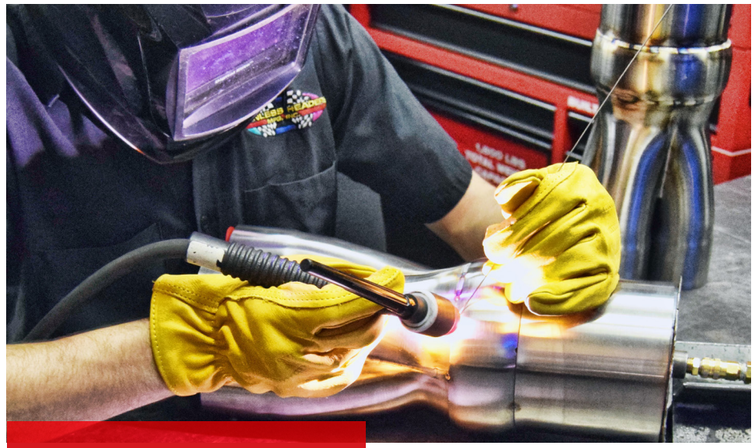

Building custom headers takes patience and skill, even for pros. But it's not beyond what a motivated DIY builder can handle, said our source at Stainless Headers Mfg.

One of the more unique exhaust-system developments is oval exhaust tubing. "Cars are getting more powerful, and they're getting lower to the ground for aerodynamics," explained Zimmerman. "They need to have large exhaust tubes, but they don't have the ground clearance. Our oval exhaust tubing is great for being able to hit the large cross-sectional area and still keep things tucked up tight into a floorboard, or even inside a rocker panel."

To further enhance ground clearance, the company has also developed a unique, proprietary slip joint for its oval exhaust systems. "With our slip joints, you don't have to run flanges and eat up some of that ground clearance," said Zimmerman.

For dual-purpose cars, catalytic converters are still a consideration. That can be a vexing problem for serious competitors who want maximum performance in a street-legal combination.

"To try to meet an emissions standard, the cats on production exhaust systems have gotten closer and closer to the engine," said Roman. "To get the full benefit of a racing header, you want to have a long-tube header, so that's usually not compatible. For example, there are aftermarket headers built for C8 Corvettes that incorporate the stock cats in their original places. But other than getting a tube header, you're not really getting much benefit."

Whatever combination of car and engine you're working with, today's component suppliers offer more options than ever before to make the task of building an exhaust system easier, faster and more effective. Building custom headers is still challenging work that requires considerable skill and patience. But now more than ever, it's possible to finish the exhaust portion of a race car in a way that looks good and works efficiently, which leads to better power and increased performance. PRI

SOURCES

Burns Stainless
burnsstainless.com

DC Sports
dcsports.com

icengineworks
icengineworks.com

Performance Tube Bending
ptbtubebending.com

Specialty Products Design
spdexhaust.com

Stainless Headers Mfg., Inc.
stainlessheaders.com

Ultimate Headers
ultimateheaders.com

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THE COATING QUESTION

AS PARTS-COATING TYPES PROLIFERATE, WHAT KIND OF REAL-WORLD BENEFITS CAN RACERS EXPECT FROM THESE TREATMENTS?

By Drew Hardin

"Coatings have grown up."

That's how Richard Tucker of Swain Tech Coatings, Scottsville, New York, summed up the current state of the coatings industry compared to, say, 20 years ago. "Folks who oversold what they could do, or who didn't apply the right coating to the right application have fallen by the wayside on a large scale. There still could be coatings that will be misapplied or over-promoted, but it's not part of mainstream coating anymore."

In other words, the old myths surrounding coatings are mostly gone.

"Don't dismiss it as snake oil until you try it," said Jason Arbogast of Tech Line Coatings, Rutledge, Tennessee. "There is science behind it. There is data behind it. There are a lot of guys using coatings that you may not think are using them, but that is why their stuff is holding together and working. And they may not tell you that."

Any concerns that engine builders and race teams may have about coatings these days will have more to do with their proliferation than their performance. "People don't understand what this myriad of coatings is capable of doing," said Carl Benton of PolyDyn Performance Coatings, Houston, Texas.

"The gap that we see, from an end user's point of view, is that it can be hard to tell the difference among coatings and suppliers, why one may work better than another," said Carrie DiMarzio of Industrial Hard Carbon (IHC), Denver, North Carolina.

There also can be a tendency of end users to view coatings as some sort of magic bullet, that "if a coating was applied to any surface, it would improve that surface or system," said IHC's Gokhan Yildiz.

That's why IHC, and other companies that contributed to this story, spend time educating their customers as to the realistic benefits they can expect from coating performance parts. "We're not just a coating supplier, we are a solution provider," said DiMarzio. "It's not, 'Do we use coatings?' It's, 'How do we use coatings?' Where in the system is the coating used? How do we design a system using coatings? Because everything is a system."

What follows is a deeper dive into how engine builders and racers can best use coatings, and what they can realistically expect from coated parts.

BASIC PROPERTIES

The variety of coatings available to racers goes far beyond the oft-used lubricants and thermal barriers. There are coatings that attract oil and others that shed oil. Some coatings disperse heat, while others trap heat. There are dry film coatings, diamond-like coatings, hard-anodized coatings, polymer-based coatings, ceramic coatings, thin- and thick-film coatings, coatings with a jewel-like finish, and coatings that one manufacturer promotes as "ugly."

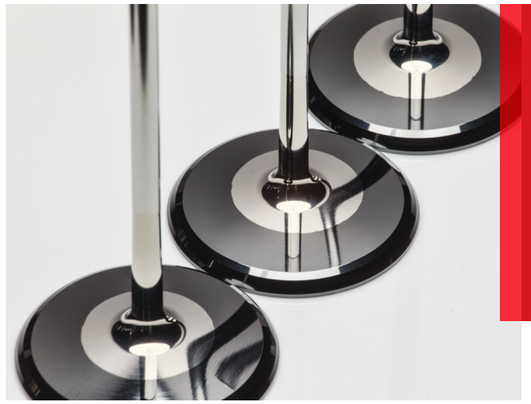
There are single-purpose coatings, but there are also coatings that serve multiple purposes. "For instance, our thermal dispersant coating dispels heat, is oil shedding, and is corrosion resistant," Arbogast said. "Guys will use that on connecting rods to keep heat out of the rods and help them last longer. That gives you more life expectancy in drag race applications, especially with aluminum rods." That same coating can also be used "on water pumps, oil pans, valve covers, carbs, alternator housings and so on," he added. "We have coatings that literally go from the carburetor to the oil pan. How far do you want to take your coatings?"

Photo Courtesy of Tech Line Coatings

In some cases, a single component may receive several different coatings. "For example, different coatings can be applied to the head, stem, and tip of a valve depending on the specific engine design," Yildiz said. "We have to consider environmental factors such as temperature and lubrication and look closely at the type of interactions present with the countersurfaces, the valve guide and seat, prior to providing a coating solution. For instance, the head of a valve can be coated with DLC [diamond-like carbon film], while the stem and tip are coated with CrN [chromium nitride]."

Go from the simplicity of a valve to a complex component like a turbocharger and the coating options grow even further, said Benton.

"On the hot side, which drives everything, putting on a ceramic coating that can tolerate the heat will hold more heat in the turbocharger, which will drive the compressor wheel better and protect the compressor wheel, so it doesn't melt. We can protect the exhaust housing so it doesn't turn into a rusty mess. We can do the same thing with the center section, coat it so it doesn't turn into a ball of rust. We can do some really trick things with the compressor. If you put our PD-14 Silver on the inside of the compressor housing, it will flow 7%–9% more air because the coating alters the boundary layer of air." (PolyDyn has also used PD-14 Silver on carburetors to achieve the same effect.)



Modern coatings can offer a wide range of benefits for race engines. Some components, such as valves, often have multiple coatings to accomplish different objectives, said our source at Industrial Hard Carbon.

When it comes to the turbocharger's bearings, "because of the way my coating holds oil on the bushing bearings, they last and last," Benton said. "When you keep the hydrostatic layer of oil in place, you have no friction at all, so the turbo spools like crazy."

Line2Line Coatings of Clarkston, Michigan, offers abradable graphite coatings that are used to minimize running clearances between components. These are "thick, fuzzy, abradable coatings based on graphite and resins" that can be used to restore parts from pistons to oil pumps, explained Andy Suman. "We can build up components so they fit better than when they were new." The graphite-based coating is applied thicker than traditional solid film lubricants, often creating a line-to-line fit at assembly. During initial operation, the coating safely hones itself to the ideal operational fit. The final geometry accounts for machining tolerances, assembly torque distortions, thermal expansion, and kinetic strains, because they are all present during the break-in. During the wear-in, tiny coating particles (mostly under 5 microns) are released into the oil. Suman said there is no need to change the oil after break-in, "but it could have a gray hue from the graphite. After the initial run-in, the wear stops, so future oil changes look normal."

FUNDAMENTAL COATINGS

With so many options available, where does the selection process begin?

"THERE ARE A LOT OF GUYS USING COATINGS THAT YOU MAY NOT THINK ARE USING THEM, BUT THAT IS WHY THEIR STUFF IS HOLDING TOGETHER AND WORKING."

"People will ask, 'If you were going to coat something in the motor, what would you start with?'" Benton said. "Pistons and bearings. Those would be the first two things, because if you're going to hurt something in the motor, it's usually one of those."

Tucker called those "the fundamental coatings, like coating the rod main bearings with a lubricating coating as a backup form of lubrication for cold-start situations and oil starvation, or situations where your oil film can't perform the role it's intended to. With a more aggressive tune, when it's more likely that a tuning error, or bad fuel, or something else could damage the piston from a heat standpoint, then you might consider adding a thermal barrier to the top of the piston."

"We study each application very closely from a tribological standpoint," Yildiz said, defining tribology as "the science of interacting surfaces in relative motion. If you have two surfaces or components that are in contact in a certain environment, you have a tribosystem."

When IHC designs a coating, "these are the things we have to hone in on to provide a suitable coating for that specific tribosystem," he said. "What is the substrate material of the two components that are in contact with each other, and how well are the surfaces prepared? What is the working temperature? Is it a dry or lubricated environment? Is it a high load or sliding application? Or both? There are lots of tweaks we can do, or that people can choose, keeping the goal in mind to serve the tribosystem as best as possible."









The visual appeal of coatings is important for many customers, and suppliers try to accommodate whenever possible, such as on these headers coated by Tech Line Coatings.

PROPER PREP

Other than coating choice, probably the most important—and sometimes overlooked—factor in a successful coating application is the preparation of the parts prior to coating. "It's like painting a car," Benton said. "When I talk about preparation, 85% of the time a part is in PolyDyn's shop, it's in preparation."

Tech Line Coatings puts so much emphasis on proper pre-coating preparation that it has shifted its marketing focus almost exclusively to professional engine shops and away from retail and DIY enthusiasts, Arbogast said.

"A lot of engine builders put their stuff together in a clean room, take the time and make sure it's right because with those guys, their name stands behind it," he explained. "Like our name stands behind our coatings. We want it to go to a guy who's going to put it on the right way."

Surface preparation is critical, Yildiz added, because the thin film coatings that IHC applies are "typically 3 to 5 microns thick. Five microns is about 0.2 thousandths of an inch, a very minimal dimensional change to the component. If you have a component with certain surface roughness, or peaks and valleys on the surface, the coating is not going to cover those up or smooth the surface. Because it's only 3 microns thick, it will conform to the surface."

Those peaks and valleys can lead to what Yildiz called abrasive and/or third-body wear. "A rough surface can limit the frictional gains and wear-reducing properties the coatings are designed to provide and will act as an abrasive in most cases," Yildiz explained. "That's why we have to look at the mating surfaces at a microscopic level and, if necessary, take appropriate steps to improve the surface finish prior to applying coatings to ensure favorable results."

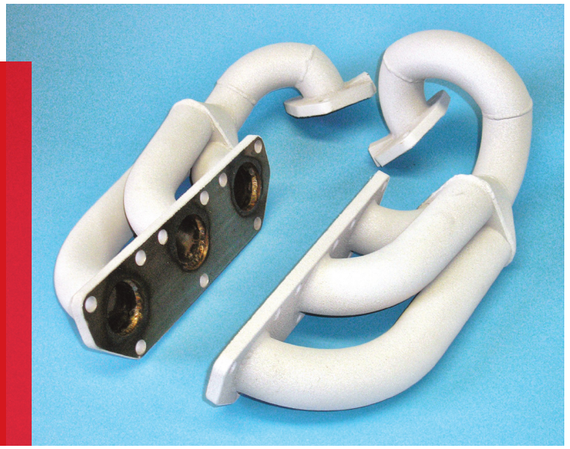
COATING APPEARANCE

"Guys have asked me for a particular coating because it looks the prettiest," Arbogast said, "but it may not be right for their application."

For the most part, our experts said, a coating's appearance is not necessarily indicative of its performance.

"Sometimes, the materials used inside the coating don't lend themselves to a high-gloss, high-luster finish," Arbogast said. "We're trying to make them prettier, but ours have been more function over form." Tech Line Coatings' CBC-1 and CBX piston-top coatings have, respectively, a chalky white and gray metallic finish. "CBX was made for combustion ratios of 12.5:1 and up and supercharged and nitrous applications," he explained, "while CBC-1 was designed for 12.5:1 and lower." Tech Line Coatings also offers a gold piston top coating "that a lot of customers want because it looks prettier, and it works well for 9.5, 10.5, sometimes 11:1 combustion applications." The gold coating will work in engines with higher combustion ratios, "but it may not work as well, and you could lose the gold color."

"We strive for perfection, because it's better for the end user to see something that looks like jewelry or a piece of art," said DiMarzio. "But the looks don't tell you it's great or bad. You want to understand the overall systems, the materials the film is deposited on, the compositional performance of the film being deposited, and how it's going to benefit the application depending on temperature, wear, pressure, what it interacts with."



Exhaust components are especially harsh on coatings. Multiple layers of coatings are typically applied for extra protection, according to our source at Swain Tech.











Effective coatings can improve engine longevity considerably; this piston from a 3000-hp Pro-Mod engine has withstood 40 passes, according to coating supplier Line2Line.

"We actually promote our exhaust parts coating as an ugly coating," said Swain Tech's Tucker. "When it's put in use it's difficult to keep clean, because when it heats up it can get growths on the surface of the coating. There have also been times when the base metal of the exhaust can expand more than the layers of the coating can expand, and that can lead to a fracture of what tends to be the outermost layer of the coating."

Not to worry, he said. "One of the reasons we put it on in multiple layers is it's virtually impossible to get all of the layers off," added Tucker. "And even if you fracture the outermost layers, the remaining layers are more insulated than the coatings that are primarily put on the exhaust parts to improve their look."

"The beautiful looking, polished ceramic exhaust coating holds the heat inside like it's supposed to," Arbogast noted, "but it's limited in its applications. The outside gloss can handle a surface temperature of up to 1,300 degrees. That's fine on most applications, but when you start talking about something like a twin-turbo diesel, which is going to put a huge amount of exhaust heat in there, you're going to lose the finish. The coating is still on the part, but it just doesn't look as good as it did." To help slow and even prevent that from happening, he recommended putting a base layer of coating on the exhaust that can withstand higher temperatures and following it with an attractive top coat.

MEETING EXPECTATIONS

There are so many variables in how race engines (or transmissions, differentials, or other components that can be coated) are built and used that quantifying the benefits of coatings in an exact way is difficult. No one can say, for example, that an engine with coated bearings will make X number of drag strip passes before teardown compared to one with uncoated bearings. Or that the friction losses from coating piston skirts will result in an increase of X horsepower.

In fact, said Tucker, "as we have gone from primarily carbureted motors to fuel-injected motors with electronic management, it's much harder to get power gains by just doing the coatings. Management systems are so effective at maximizing and getting real information in real time. With a carburetor it was much more blind, so it was pretty common to see a noticeable power increase by coating combustion chambers or piston tops."

Instead, at Swain Tech, "we're primarily talking to people about adding a measure of protection in case there's a tuning error," Tucker continued. "In the racing world you're often tuning noticeably closer to the edge of what the parts can take than you would on a street application. When they are adding more power, running the motor under heavy loads for long periods of time, or there are inherent challenges to the motor in general, it makes more sense to add those coatings."

> "WE'RE NOT JUST A COATING SUPPLIER, WE ARE A SOLUTION PROVIDER."

"What some people don't realize about coatings," Arbogast explained, "is that to truly see performance advantages from the coatings, the engine needs to be re-tuned after coating. We've had a couple customers call and say, 'I just spent a lot of money coating all my stuff in the motor, and I can't see a difference.' We will then ask, 'Did you retune it? Readjust your fuel? Readjust your ignition system? Readjust your timing? If not, you're not going to see those differences.' By coating the parts, they will last longer, but to get the full benefit, it will take some adjustments to the engine."

Coating companies may not make sweeping generalizations about horsepower and durability gains, but there are plenty of anecdotal examples of the benefits of these products.

PolyDyn's Benton said he found using an oil-shedding polymer to coat the crankshaft counterweights in a wet-sump Chevrolet 350 engine—"there's like gazillions of them in roundy-round cars, right?"—was worth 14 to 16 horsepower above 4,000 rpm. "A coated-up motor comes off the corner like gangbusters, and it also rpm's smoother."

When he and his son were racing a NASCAR Late Model with a Windsor engine, Benton coated the car's transmission and

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quick-change rearend. As a result, "it only lost 15 horsepower from the flywheel to the tire. When you go out there with that kind of advantage, and you tell your driver that you have a secret weapon, for some reason they drive harder and they're unstoppable."

The benefit of Line2Line's clearance-control coatings is that "everything lasts longer if it's not rattling," said Suman. "If it's not rattling, it's not piercing oil films, and your parts aren't rubbing on each other. Pistons are our workhorse. We've seen people who would get 15 nights on a set of pistons now run 45 nights because the rattle is gone."

Added Line2Line's Mark Gelstein, "One of our customers had a brand-new gerotor oil pump that at idle or low rpm was making 20 to 22 pounds of pressure. We coated all the internals, and now it never drops below 55 pounds with that same hot, thin oil."

Suman and Gelstein are proud of the fact that "we're the guys at the PRI Trade Show with the table full of used parts," Gelstein said. "We love showing off what a 3,000-horse blown alcohol Pro Mod piston that has 40 passes on it looks like. It looks like brand new."

The most dramatic anecdote we heard came from Arbogast: "We got a chance to help out a local guy doing his drift car engine, a supercharged LS motor. We told him putting coatings on would give him a few more horsepower, manage heat better, and provide longevity for the parts, which was important for him, since while drifting, the car will see constant 6,000–7,000 rpm throughout the run."

On his first event, while in the middle of a run, "the blower belt shredded, pulled off the boost reference gauge, and the motor went to a full lean condition at 6,000 rpm," Arbogast continued. "But instead of detonating and blowing holes in the side of the block, the motor stayed together. Some of the parts were scorched inside, some of those bearings were squished, but he did not see the catastrophic failure that would have happened without the coatings. And because the pistons did not seize inside the block, and the bearings were not welded to the crank, he was able to pull the motor apart and put in new bearings, a couple of new rods, and some new pistons. The heads were salvageable, the valves were salvageable, and there was no hole in the side of the block. He was tickled to death." PRI

SOURCES

Calico Technologies
calicocatings.com

Industrial Hard Carbon
industrialhardcarbon.com

Line2Line Coatings
line2linecoatings.com

PolyDyn Performance Coatings
polydyn.com

Swain Tech Coatings
swaintech.com

Tech Line Coatings
techlinecoatings.com







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Kluhsman Racing Components - KRC Racing Components
Kooks Headers & Exhaust
KPXA - Ken Perry's Xtreme Arias
Kraftwerks
KRC Power Steering
KRJ Race Products
KSE Racing Products Inc
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Kwik Bond Polymers
Kwik-Way
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Laris Motorsports Insurance
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LAT Racing Oils
Late Model Engines
Lear Chemical Research Corp
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Lincoln Electric
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Lite Metals Company
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Livernois Motorsports and Engineering
LOCK-N-STITCH Inc
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LSM Racing Products - Logan Smith Machine Co Inc
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MOMO
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Morimoto Lighting
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Moser Engineering
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MPD Racing - Ti22 Performance
MPI USA Inc
MR RACE OIL - Cam-shield
MRCOOL
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MW Company LLC
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MyRacePass
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National Performance Warehouse - NPW
National Sprint Car Hall of Fame & Museum
Neal Chance Racing Converters
Neapco Drivelines - Performance Series
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Neo Synthetic Oil
New England Gear Polishing LLC
Neway Manufacturing
NF&M International
NGK Spark Plugs USA Inc
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Noise Barriers
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Northern Radiator
Northwood University
Nu-Ice Dry Ice Blasting
Oasis Scientific Inc
Oberlin Filter Company
Oetiker - Jiffy-tite
Offroad Motorsports Youth Foundation
Ohio Brush Works
Ohio Crankshaft
Ohlins USA
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Pace American Trailers
PAGID Racing
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Palmgren
Parella Motorsports - SVRA, Trans Am & FR-F4
Patriot Race Engineering
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PE Racing
Pedders Suspension & Brakes
peel 3d
PEM Racing
Penn Grade 1 High Performance Oil
Penske Racing Shocks
Performance Automatic
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PRW Industries
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PXP Racewear
Pyrotect
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QualCast
Quantum Machinery Group
Quarter Master - Custom Floaters
Quick Drive LLC
Quick Performance
QuickCar
Quicksilver
R&M Race Trailers
Race Canopies Division of Eide Industries Inc
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Race Monitor
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PRI EDUCATION SESSIONS

THURSDAY 12/9

BUILDING YOUR BRAND & BUSINESS SIMULTANEOUSLY
w/ CHRIS SALEM
10:00 AM–11:30 AM | ROOM 233

COMPETING FOR QUALITY: HIRING & EMPLOYEE RETENTION
w/ ED KROW
1:00 PM–2:30 PM | ROOMS 231–232

CONVERTING SEARCH TRAFFIC INTO SALES TRAFFIC
w/ JASON DODGE
1:00 PM–2:30 PM | ROOM 233

PERFORMANCE ENGINE BEARINGS: FUNDAMENTALS & DESIGN
w/ DAN BEGLE
1:00 PM–2:30 PM | ROOM 236

AIR SPEED IN ICE & BENDING THE RULES FOR MORE POWER
w/ DARIN MORGAN
2:00 PM–4:00 PM | ROOMS 234–235

UPDATE ON RPM ACT & EMISSIONS COMPLIANCE
w/ DANIEL INGBER & DAVID GOCH
3:00 PM–4:30 PM | ROOMS 231–232

WHY YOUR PERFORMANCE BUSINESS DOES NEED A WEBSITE
w/ BRIAN LEWIS
3:00 PM–4:30 PM | ROOM 233

3D COMPUTER FLOW ANALYSIS SIMULATION OF PERFORMANCE INTAKE & EXHAUST PORT
w/ DAN AGNEW
3:00 PM–4:30 PM | ROOM 236

FRIDAY 12/10

RACING VALVE SPRING DESIGN AND DEVELOPMENT
w/ CHRIS OSBORN
8:00 AM–9:00 AM | ROOM 233

5TH ANNUAL WOMEN IN MOTORSPORTS PANEL
w/ JEANETTE DesJARDINS
8:00 AM–9:00 AM | ROOM 231–232

SHOCK TROOPS: THE VIEW FROM THE COUNTER
w/ BOB BALDERSTON (PLUMB BOB)
8:00 AM–9:00 AM | ROOM 236

FACEBOOK 2022: BUILD YOUR REACH WITHOUT BREAKING THE BANK
w/ JENNIFER CARIO
10:30 AM–11:30 AM | ROOMS 231–232

YOU'RE MAKING MONEY, BUT WHERE'S THE CASH?
w/ TOM SHAY
10:30 AM–11:30 AM | ROOM 233

WTF IS CONTENT?!
w/ JUSTIN CESLER
2:00 PM–3:30 PM | ROOM 233

PRI PRESENTS: THE PRESIDENTS PANEL
w/ ALEX STRILER
2:00 PM–3:30 PM | ROOM 231–232

THE PAST, PRESENT & FUTURE OF EFI TUNING
w/ BOB MORREALE
2:00 PM–3:30 PM | ROOM 236

SATURDAY 12/11

PRI'S INAUGURAL SOCIAL INFLUENCER/CONTENT CREATION PANEL
w/ JOHN VISCARDO
8:00 AM–9:00 AM | ROOMS 231–232

SMALL BUSINESSES DON'T DIE, THEY JUST MAKE TOO MANY MISTAKES!
w/ TOM SHAY
8:00 AM–9:00 AM | ROOM 233

MAP PRICING 101: THE GOOD, THE BAD & THE UGLY
w/ RICH BARSAMIAN
8:00 AM–9:00 AM | ROOM 236

INSTAGRAM REALITY CHECK: BOOSTING CUSTOMER ENGAGEMENT ON A BUDGET
w/ JENNIFER CARIO
10:30 AM–11:30 AM | ROOM 233

SPONSORSHIP 101: HOW TO WRITE PROPOSALS THAT SELL!
w/ ALEX STRILER
10:30 AM–11:30 AM | ROOMS 231–232

JUST THE FACTS: A CAN'T-MISS PANEL ON RACING FLUIDS
w/ KYLE FICKLER
10:30 AM–11:30 AM | ROOMS 234–235

ENGAGING THE NEXT GENERATION: YOUTH MOTORSPORTS DEVELOPMENT 101
w/ McKENNA HAASE
1:00 PM–2:30 PM | ROOMS 231–232

AIR SPEED IN ICE & BENDING THE RULES FOR MORE POWER
w/ DARIN MORGAN
2:00 PM–4:00 PM | ROOMS 234–235

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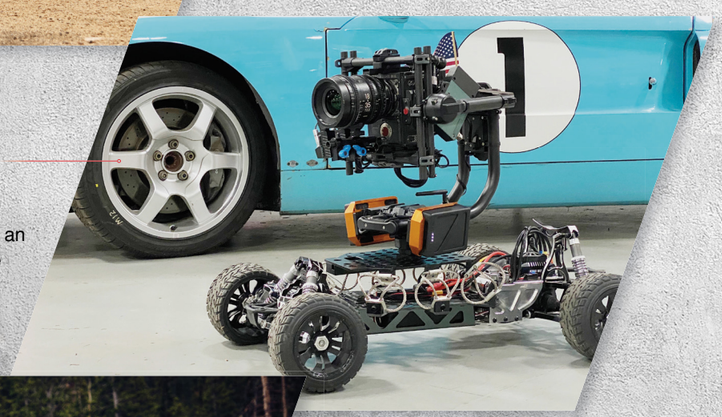

CONTENT CREATION PRI

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SUPER SIZED

Racers asked for it and Chevrolet delivered: a 572-cubic-inch big block option for the 2022 COPO Camaro.

By Mike Magda



Photos courtesy of Chevrolet

After a decade of promoting only high-powered late-model LS and LT engines, GM's COPO Camaro program shocked the drag world by announcing the availability of a 572-cubic-inch V8 based on classic Chevy big block engine architecture.

"You're always trying to do something a little bit new," said Brent Schultz, NHRA program director at Chevrolet Motorsports. "There have always been talks internally about doing a big block, and there always have been racers asking about it."

The 572 COPO engine will be one of three engine options in the 2022 COPO Camaro, which is a custom-order car designed for NHRA Stock, Super Stock and Factory Showdown racing.

"I can't give away numbers, but just a couple days after the announcement we had a surprising number of people putting down their money," added Schultz.

The big block COPO Camaro has a base price of $105,500 and is NHRA rated at 430 hp. Also available for 2022 is a 427-cubic-inch LS engine with a NHRA-rated 470 hp, starting at $117,500; and the 350-cubic-inch LS with a 2.65-liter supercharger, which is NHRA rated at 600 hp and carries a $130,000 base price. All engines are mated to a TH400 three-speed automatic built by ATI, and there are numerous paint, graphic and equipment options available to the customers.

Given GM's very vocal position on developing a full line of production electric vehicles (EVs) and the introduction a couple years ago of the eCOPO concept, an 1,100-hp all-electric Camaro capable of nine-second runs at the drag strip, the 572 was a curious choice.

"GM is committed to an all-electric future, and EVs will find a way into motorsports," explained Schultz. "We really listen to our customers, and there have been requests over the years for an old-school big block. At the end of the day, even though EV is the direction of the company, we're not going to lose sight of our customers along the way."

Based on the ZZ572/720R crate motor from Chevrolet Performance Parts, the 572 COPO engine has changes to the top and bottom ends. First, the oil pan is a Moroso 7-quart deep-sump style designed so the engine will sit in the Camaro chassis. The original four-barrel intake and Holley Dominator carb are replaced with an EFI port-injection system that includes a Holley Hi-Ram style top lid from the LS7 COPO engine. GM engineers had to redesign the intake manifold base to accept the lid and also fit under the COPO hood and custom carbon-fiber air box.

"They had to develop something that not only mates the upper lid to the ports but doesn't choke the engine or put the torque curve way off into the weeds," said Schultz, noting that NHRA officials were pleased that a new hood didn't have to be approved.

The fuel system also includes a 90-mm billet aluminum throttle body and 58 lb./hr. high-impedance fuel injectors. Finally, a modern coil-per-cylinder ignition system was developed for the engine.

"One thing we've done with all the COPO cars is run a vigorous validation cycle. A lot was done with the [engine management] calibration," explained Schultz, noting the test engine ran more than 200 simulated track passes on the dyno before it was disassembled and inspected. "It wasn't like it had its tongue hanging out—it was running fine. But we still tear it down to see if anything is on the edge."

The modern COPO cars have never seen a big block—especially a tall-deck—so engineers had some challenges in fitting exhaust headers and plumbing. The COPO 572 features an iron Bowtie cylinder block (4.560-inch bore), Callies forged 4340 crankshaft (4.375-inch stroke), Manley H-beam rods, Clevite bearings, JE pistons (12:1 compression ratio), billet-steel mechanical roller camshaft and Edelbrock aluminum rectangular-port cylinder heads fitted with Ferrea valves (2.250/1.880).

GM has submitted the final paperwork with a proposed horsepower rating to NHRA so the 572 COPO can be classified for Stock and Super Stock racing. Unlike most previous COPO Camaro offerings, orders will be delivered on a first-come, first-served priority. When the program started in 2012, only 69 COPO Camaros were sold through a lottery in a given year, but the COVID-19 disruption prompted officials to do away with the limit. More than 700 modern COPO Camaros have been delivered since the program's inception.

The iconic 69 figure dates back to the 1960s when performance Chevy dealers discovered a loophole around GM's ban on engines over 400 cubic inches in certain production vehicles. They were able to order big block engines in different cars through the Central Office Production Order (COPO) system, which carried options not listed on regular dealer order sheets. In 1969, a few dealers ordered a total of 69 Camaros using the ZL1 engine code, which was an exotic all-aluminum 427-cubic-inch V8 that Chevy developed for Can-Am racing. Thus, the COPO Camaro legend was born. PRI

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Chevrolet
chevrolet.com/performance-parts/copo-camaro

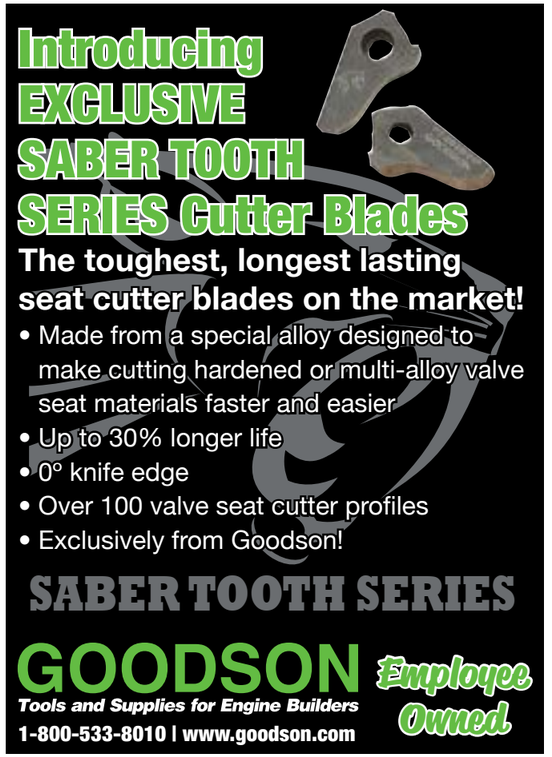





Photo courtesy of Polaris

New trim levels and options continue to expand the appeal for this segment-defining UTV, but it's still core capability that makes the RZR such a compelling option for side-by-side racing.

By Bradley Iger

When Polaris launched the original RZR 800 in 2007, the Medina, Minnesota-based manufacturer didn't realize that its new UTV would be instrumental in kick-starting a burgeoning segment of motorsports. But it had a hunch that a large contingent of enthusiasts was underserved by the side-by-side market at the time.

Rather than upfitting one of its existing models, Polaris instead took a more comprehensive approach, creating a UTV that was intended for performance from the get-go.

"At the time, the only side-by-sides we were building were Rangers, and the approach there was, 'work first, play second,'" said RZR Product Planning Director Pat McArdle. "That meant large utility boxes on the back, upright bench seating, things like that. With RZR, we wanted to make something where the priorities were more like designing a motorcycle or a sports car: The operation of the vehicle is activity." Accordingly, Polaris developed an entirely new platform with a new driveline configuration, a sport-oriented seating position, and a new long-travel suspension system to deliver a combination that would truly resonate with enthusiasts.

Fourteen years later, the RZR Pro XP—Polaris' current top-spec performance offering—has evolved into a stunningly capable machine that's probably more closely related to Trophy Trucks than it is to its forebears. Dishing out 181 horsepower from a turbocharged 925cc four-stroke, dual-overhead-cam, two-cylinder engine, this 2,000-pound UTV boasts 14.5 inches of ground clearance and a trailing arm rear suspension that delivers up to 22 inches of travel. Yet it can also be optioned with creature comforts that include a 7-inch touchscreen display and a Rockford Fosgate audio system with a 400-watt subwoofer, an indication that the appeal of recreational UTVs extends well beyond the hardcore set.

Still, it's capability that put the RZR on the map in the first place, and to showcase what the company's latest model can do, Polaris invited us out to Elk River, Minnesota, to put the machine through its paces at ERX Motor Park, a facility that's purpose-built for the task.

After settling into a bolstered bucket seat and tightening down the factory six-point harnesses, it didn't take long to identify where the appeal lies. The RZR Pro XP's turbo mill was eager to please, effortlessly dispatching both hill climbs and lengthy straights. The 20 inches of suspension travel at the front end shrugged off all matter of rough terrain and airborne shenanigans with minimal drama, encouraging us to increase the pace with each successive lap.

Pro XP models outfitted in Ultimate trim also feature Fox 2.5 Podium shocks at all four corners. These are active dampers that adjust to steering angle and other inputs in real time to improve stability, much like the adaptive suspension setups found in today's performance cars. Its baseline stiffness can be adjusted to Comfort, Sport or Firm settings via the touchscreen system. Models equipped with these active dampers also get a big red button on the steering wheel that allows the driver to instantly set the dampers to their firmest setting, essentially a failsafe against bottoming out if the Pro XP has carried a little too much speed off that last jump.

The charm here, though, comes from the simplicity. With the CVT dutifully keeping the engine in the powerband, there's hardly any learning curve to speak of—just point and shoot. It allows nearly anyone with basic performance driving experience to quickly turn the focus to their line and how much speed can be carried through a given section, and that equates to a compelling foundation for a competitive machine.

While sanctioning body rules require basic safety equipment to compete, which generally include an aftermarket cage, seat and harnesses, McArdle noted that would-be UTV racers tend to approach overall race prep from two different schools of thought in terms of trim levels. "The Pro XP is at the top of the heap and would probably be the best option for most racers right now. That's going to deliver the most power in the RZR lineup, the most capable chassis from a durability standpoint, and on the Ultimate trim you get the most advanced suspension we offer. So there isn't as much of a need to upgrade, even in a harsh racing environment."

That said, racers who tend to gravitate toward specific formats and already have a plan in mind to make their vehicle more competitive might be better off starting with a RZR Pro XP Sport—ostensibly the base trim in the Pro XP lineup—to avoid paying for upgraded components that they're just going to replace anyway.

"Typically, we'll see guys who race in the desert using beadlock wheels, for instance, to make the tire stay connected if they get a flat," McArdle said. "There's also a ton of different variables that go into tire choice. Desert racers will be looking for something that's more like a light truck type of tread, while the mud guys are going for a tractor-style tread. Short-course guys often run smaller wheels and tires to effectively change the gear ratio in order to get better acceleration, and they're dropping their suspensions down. They don't need the same kind of ground clearance as those other formats, so bringing the center of gravity down can improve cornering."

When it comes to maintenance, the conversation naturally turns to the CVT belt. "There are actually some really simple things a driver can do to get much better belt longevity," McArdle noted.

"First, instead of gradually easing into the throttle like in a passenger car, get the vehicle moving with the throttle right away. Cars and trucks have torque converters, but with these UTVs, the clutch is trying to clamp on the belt to get things moving, so you're basically slipping the clutch. So the faster you can do that, the less slip you're creating. Doing belt break-in properly is hugely important too because that is matching the belt angle to your specific vehicle. And the third thing is that if you're riding hard and come to a stop, that's putting a ton of heat into that belt in specific places, and heat is the enemy here. What I usually tell folks is that when they get to a point where they're going to stop, throw the transmission in 'park' or 'neutral,' rest a foot on the throttle and bring the revs up to 3,000 rpm or so for about 30 seconds. That will engage the belt and transfer the heat out of it. Do that while you're taking off your helmet and harnesses, and it makes a world of difference."

As for what's next from Polaris in the realm of RZR, McArdle wasn't willing to divulge any specific product planning secrets, but it's clear that the company isn't resting on its laurels. "We're always looking at where innovations are happening in this space. All I can say is that we're definitely not bored right now." PRI

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INDUSTRY NEWS

JIM LIAW NAMED NEW GENERAL MANAGER AT PRI

Jim Liaw, best known as co-founder of Formula Drift, has been named the new General Manager at Performance Racing Industry (PRI).

Working in conjunction with PRI President Dr. Jamie Meyer and the PRI management team, Liaw will direct and oversee all activities related to the PRI Trade Show, PRI Membership, PRI Magazine, online content, and promotion for all segments in the motorsports industry. He will be based out of PRI's headquarters in Aliso Viejo, California.

"We are thrilled to welcome Jim to the PRI team," Meyer said. "He has a proven track record of success, and he knows and understands the motorsports industry like the back of his hand. He has vision, leadership, and passion—and he shares PRI's mission to protect and grow the racing community."



Jim Liaw

Since its inception in 2003, Formula Drift under Liaw's direction has grown to become the world's premier drifting series. This year alone it has produced more than a half-dozen major events across the US, from Florida to California. The season is scheduled to conclude later this month (October 22–23) at Irwindale Speedway.

Prior to establishing Formula Drift, Liaw served as sales manager for one of the first sport compact drag racing series, Import Drag Racing Circuit (IDRC). Before that he worked at McMullen Argus Publishing (now Motor Trend) as a sales associate for *Sport Compact Car* magazine.

"I'm not afraid to innovate and push boundaries," Liaw said. "I know there are challenges facing today's motorsports industry—attracting younger fans, combating government restrictions, supporting race tracks and in-person events, and protecting racers' rights—and I am excited to be part of the PRI team supporting this incredible industry."

SEMA NAMES BENJAMIN KAMINSKY AS DETROIT OPERATIONS MANAGER

The Specialty Equipment Market Association (SEMA) has announced the hiring of Benjamin Kaminsky as the new SEMA Garage Detroit operations manager. Earlier this year, SEMA announced the purchase of a 45,000-square-foot building in Detroit, Michigan, to be used as a second SEMA Garage.



Benjamin Kaminsky

In his new role, Kaminsky will be responsible for the overall management of SEMA Garage Detroit services and facilities to assist members with new product development and integration.

INDUSTRY MOURNS RACING JOURNALIST ROBIN MILLER

Award-winning motorsports journalist and broadcaster Robin Miller has passed away at the age of 71. With a deep-rooted passion for open wheel racing, the Indiana native was a prominent voice for IndyCar and motorsports for five decades.



Robin Miller

In 2019, Indianapolis Motor Speedway launched the Robin Miller Award to recognize individuals who have brought "unbridled passion and an unrelenting work ethic to enrich the sport." He was also inducted into the Motorsports Hall of Fame of America (MSHFA)'s most recent class, honored during a special ceremony at IMS in August, just weeks prior to his passing.

WHARTON AUTOMOTIVE GROUP ACQUIRES SST

The Wharton Automotive Group has acquired Silver Sport Transmissions (SST). The Wharton Automotive Group, consisting of McLeod Racing and FTI Performance, is owned by NHRA Nitro Funny Car driver and businessman Paul Lee. SST CEO Jack Silver will retire from his position.

"The employees of Silver Sport Transmissions have become my family, and the decision to retire was not easy, but after speaking with Paul Lee, I knew I was leaving the company in the best of hands," Silver said.

FIFTY FIVE PROMOTIONS ACQUIRES SKAGIT SPEEDWAY

Fifty Five Promotions will take over ownership of Skagit Speedway from Steve Beitler. The dirt track is based in Burlington, Washington.

Fifty Five Promotions is a new promotional group comprised of Washington-based car owners Kevin Rudeen and Mike Anderson, and California-based promoter Peter Murphy.

"We have some exciting surprises planned for the fans and the racers," Rudeen said.

SUNNEN PROMOTES CHRIS MILTENBERGER TO CEO

Sunnen Products Company in St. Louis, Missouri, has announced the promotion of Christopher Miltenberger to Chief Executive Officer. He first joined Sunnen as president and chief operations officer (COO) in 2015 with extensive operations, engineering, and business development experience. During his tenure, he has been instrumental in Sunnen's transformation of global operations and improving customer contact management and relationship development, according to Sunnen.

"Chris has demonstrated over his six years with Sunnen that he is very capable of leading this organization," said Chairman Matthew Sunnen Kreider.

NASCAR NAMES NEW CHIEF HUMAN RESOURCES OFFICER

NASCAR has announced that John Ferguson has been hired to lead human resources strategy for the Daytona Beach, Florida-based sanctioning body as senior vice president and chief human resources officer.

Ferguson will oversee NASCAR Human Resources and provide strategic leadership around talent acquisition, employee engagement, and culture development.

TORQUED DISTRIBUTION ADDS NEW SALES & MARKETING MANAGER

Torqued Distribution—the warehouse distributor of performance brands based in the UK and Europe—has announced Lou Lobsinger as its new head of sales and marketing.

With more than 20 years of automotive marketing, sales, and product development experience, Lobsinger will be responsible for the global sales and marketing teams, driving revenue across all channels, contributing to product and vendor selection, and general management responsibilities. He previously served as the national sales manager at Specialty Auto Parts USA/PROFORM and as the co-founder of Detroit Muscle Apparel.

CENTERFORCE NAMES NEW MARKETING MANAGER

Centerforce, the manufacturer of performance clutches and flywheels for classic and late model cars and trucks in Prescott, Arizona, has hired Trent McGee as marketing manager. He will oversee the company's marketing efforts, including advertising and event marketing.

McGee brings over 25 years of automotive industry experience, including serving as a technical writer for several major automotive publications.

PSC HIRES NEW SENIOR ACCOUNT MANAGER

Allen Performance Resources (APR) has announced the hiring of Robert Sager as a senior account manager for Azle, Texas-based Performance Steering Components (PSC), the manufacturer and distributor of power steering systems for motorsports applications.

According to a company representative, Sager will help facilitate, develop, and grow sales opportunities for the PSC product lines.

TEXAS MOTOR SPEEDWAY APPOINTS NEW SENIOR VP, GM

Veteran Texas Motor Speedway executive and general counsel Rob Ramage has been promoted to senior vice president and general manager of the facility in Fort Worth, Texas, as announced by Speedway Motorsports President and Chief Executive Officer Marcus Smith.

Ramage succeeds esteemed promoter Eddie Gossage, who stepped down in June.

For up-to-the-minute racing industry news, scan the QR code below or visit primag.com/industrynews.





ADVOCACY CORNER

Tracking legal, legislative, and regulatory developments impacting the racing and performance industry.

Edited by Laura Pitts

PRI's dedicated advocacy team based in Washington, DC, works nonstop to protect motorsports. We are currently tracking several initiatives on the federal and state levels, including a milestone for the important RPM Act, an update on the "Restore Bonneville" program, and information on PPP loan forgiveness.

PRI IS WORKING CLOSELY WITH KEY SPONSORS TO PUSH THE HOUSE COMMITTEE ON ENERGY AND COMMERCE TO PLACE THE RPM ACT ON THE AGENDA FOR CONSIDERATION.

RPM ACT REACHES MILESTONE 100 SUPPORTERS IN CONGRESS

Support for the bipartisan Recognizing the Protection of Motorsports Act of 2021 (RPM Act), H.R. 3281, continues to expand. A milestone 101 members of Congress have co-sponsored the bill designed to protect against overreach from the Environmental Protection Agency (EPA) and clarify the motorsports-parts industry's ability to sell products that convert street vehicles into dedicated race cars.

As of late August, the bill had 79 Republican and 22 Democratic supporters in the House, which directly resulted from PRI's grassroots campaign to raise awareness for the critical legislation. Racing enthusiasts, fans, and industry members have sent roughly 2,000 letters to Congress each week since January 1, for a total of more than 1.35 million letters to date.

Continuing its efforts, PRI is working closely with key sponsors to push the House Committee on Energy and Commerce to place the RPM Act on the agenda for consideration. As the oldest continuous standing committee in Congress, Energy and Commerce also has the broadest jurisdiction. It addresses a wide range of topics from the regulation of motor vehicles to health care, consumer protection, and national energy policy.

PRI will continue its best efforts to advocate for the RPM Act. In addition, PRI encourages race tracks, racing businesses, motorsports parts manufacturers, race teams, and related entities to voice their support for the RPM Act on social media using the assets found at performanceracing.com/rpm-act.

To send a letter to lawmakers and see a current list of RPM Act co-sponsors, visit performanceracing.com/rpm-act. For more information, contact Eric Snyder at erics@sema.org.

NEW RPM ACT CO-SPONSORS (AS OF EARLY SEPTEMBER)

VICTORIA **SPARTZ** [R-IN]
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BEN **CLINE** [R-VA]
TONY **CARDENAS** [D-CA]
BILL **JOHNSON** [R-OH]
JAKE **LATURNER** [R-KS]

RESTORE BONNEVILLE SALT FLATS PROGRAM MOVES FORWARD

As reported here in June, money appropriated by the US Congress and the State of Utah to restore the Bonneville Salt Flats was in jeopardy. The US Bureau of Land Management (BLM) and Utah Department of Natural Resources (DNR) had previously signed a Memorandum of Understanding in April 2020 to create the "Restore Bonneville" program, but no further action had been taken. Fortunately, there has been forward movement since the last report.

But first, some background: "Restore Bonneville" is modeled after a similar 1997–2002 pilot program and aims to increase salt pumping by upgrading essential infrastructure. Today, equipment in Bonneville is capable of pumping around 300,000 tons of salt back into the land per year. The new program, however, aims to increase that figure to over one million tons in an effort to restore the once 13-mile race track to its former glory. Improvements include expanding the number of wells, lining and covering water ditches, increasing salt brine processing ponds, and berming areas targeted for extra salt.

Since last reported, the BLM and DNR have released funds to drill a new water well, which is expected to add 100,000 tons of salt to current figures. In addition, the on-site weather station will be updated to be able to more precisely measure moisture evaporation rates associated with salt growth, which is vital to the restoration.

In August, PRI staff held key meetings as stakeholders—including staff for SEMA/PRI, BLM, DNR, and Intrepid Potash—seek the best way to pursue increased salt laydown while studying the results. A focus may be on devising a one-year test program in advance of pursuing the large-scale laydown.

"The Bonneville Salt Flats is a unique land formation in northwestern Utah that beckons visitors worldwide. For racers, its surface is unequaled. The hard salt crust is perfect for both speed and safety," said PRI/SEMA Senior Director of Federal Government Affairs Stuart Gosswein. "It also played a unique role in the development of SEMA and PRI. Bonneville, along with several Southern California dry lakes, were primary venues for industry pioneers to test their new products, make adjustments while they raced, and then go back to the garage to create the next generation of speed equipment. Many of these inventors then started companies that grew into the industry of today."

"FOR RACERS, [BONNEVILLE'S] SURFACE IS UNEQUALED. THE HARD SALT CRUST IS PERFECT FOR BOTH SPEED AND SAFETY."

Despite the hurdles, racing continues at Bonneville. Since 1949, the Southern California Timing Association has hosted "Speed Week," where drivers attempt to set records for various classes, from hot rods and motorcycles to stock cars and streamliners. This year's top speed went to the Speed Demon (for the 10th time), which earned a top speed of 466 mph. For more information, visit savethesalt.org.

SBA CREATES DIRECT-FORGIVENESS PORTAL FOR PPP LOANS OF $150,000 OR LESS

The Small Business Administration (SBA) now allows borrowers with Paycheck Protection Program (PPP) loans of $150,000 or less to apply for forgiveness directly through the SBA. The SBA portal is designed to streamline the process and remove pressure from small lenders to handle forgiveness applications as the SBA looks to wind down the PPP loan program.

Banks responsible for originating the PPP loans must opt into direct forgiveness before their borrowers can use the SBA's online platform. More than 500 banks have opted in, and the SBA has received more than 350,000 submissions since the program took effect on August 4.

The deadline for seeking PPP loans ended May 31, but recipients are now seeking loan forgiveness for funds used to cover payroll, mortgage interest, rent, utilities, and other costs. Loans are fully forgivable if at least 60% of loan proceeds are used on payroll costs (i.e., wages, payroll taxes, paid leave, healthcare payments, retirement, and insurance contributions).

To register and apply for SBA direct forgiveness, visit directforgiveness.sba.gov/requests/borrower/login/. For more information, contact Stuart Gosswein at stuartg@sema.org. PRI





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K1 Technologies has developed a robust H-beam connecting rod to handle the increased stresses of Ford's 7.3L Godzilla engine. It's made from 4340 chromoly material that offers increased strength and durability through better aligned grain flow. The forging is precision machined and shot-peened to reduce potential stress risers and improve service life.

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The G6 Stiletto Steering Systems universal small box from Pro-Werks is now offered in four different steering ratios. The flexibility of this compact assembly has also been expanded with a variety of rack lengths and tie rod connection point options. The housing design is made from ultra-tough 2024-T4 billet aluminum and is black anodized for corrosion resistance.

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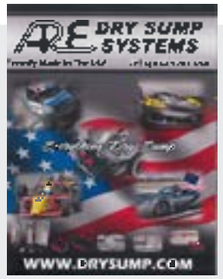

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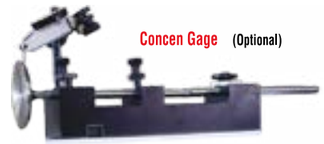
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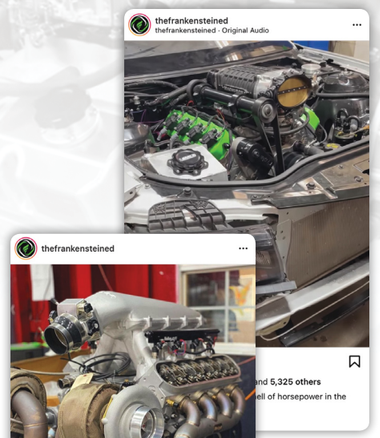
SOCIAL STATUS

A closer look at racing and performance industry members' winning strategies on YouTube, Instagram, Facebook, and more.



When it comes to social media, we've heard multiple times that content is king. And while that principle holds true, the question then becomes what kind of content gets more engagement and performs better on the various social channels? We recently spoke with a pair of performance business operators to get their input on which platforms work best for them and why.

Steve Morris Engines in Muskegon, Michigan, uses YouTube, Facebook, and Instagram, with YouTube getting the most engagement. "YouTube has given us the best results for a couple of reasons," said Kyle Morris. "The first is that the platform is very straightforward and easy to use when it comes to things like ease of access, quick editing changes, and monetization. The second is that YouTube's algorithm is slightly more fair when it comes to views and engagements on your page, as they base it on a combination of physical clicks and watch time, whereas Instagram and Facebook base their feed on predictions of what they think the post will generate for likes, view time, etc."

Plus, different platforms have different demographics attached to them, Morris noted. "For example, on Facebook and YouTube the niche that we have found that works best for our target audience is more tech-oriented and more in-depth content that goes a little deeper than just a picture of a gnarly burnout or a sick car with one of our engines in it. While for Instagram, the content that yields the best results for us is exactly that—burnouts, cars making passes, pictures of crazy engines in crazy cars, etc.," he explained.

For Weatherford, Texas-based Frankenstein Engine Dynamics, which utilizes Facebook, Instagram, YouTube, and has recently joined TikTok, "our best performing platform is by far Instagram," said Mike Shabareck. "The better your content, the better your posts will perform; and on Instagram, the algorithm apparently agrees well with our content type," which includes customer engine shots, short clips of the manufacturing process, an internal look at products, and more.

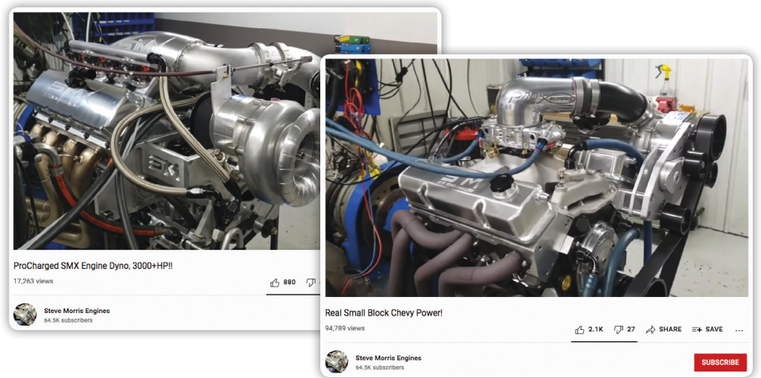
Most of the time, Frankenstein Engine Dynamics' content between Facebook and Instagram are the same. "We post a lot of short video clips and images with calls to action. Longer videos, like our Tech Series, live exclusively on YouTube, but we cross-promote those videos on Instagram and Facebook," Shabareck explained.

Once you've discovered which type of content works best for each channel, our sources advise staying consistent with quality content and, as the concept suggests, being social. "Once you create your brand's specific style on social media and your content seems to gain traction, the best thing you can do is engage with people in the comment section," Shabareck said. "Whether your company offers specific products or services (or sometimes both), people will have questions about them, and I strongly recommend answering those questions because for every person that asked, there's probably 15 more that either didn't know to ask it or have the same exact question.

"My other recommendation is to never turn down opportunities to help promote other companies in the industry (maybe not a direct competitor, though) on social media," he added. "Whether it's a customer or a vendor that makes a support component/service, that establishes quality in the consumer's mind."

Specifically referring to YouTube, Morris suggested, "Post, post, and post some more. The goal for us is to try and post once a day as long as the content stays authentic and interesting. Another big thing is thumbnails and titles on videos. Your thumbnail is that hook that gets the attention of someone scrolling through a sea of posts. Beware of click baiting, though. Try your best to hype the video up without skipping out on the content to back it up."

And, if you're a newbie to social media, Shabareck recommends starting out simple, "and the simplest thing you can do is post relevant content daily, and you'll be surprised how far that will take you." PRI



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