VOLUME 38, NUMBER 5 | MAY 2023

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CONTENTS

MAY 2023 VOLUME 38, NUMBER 5

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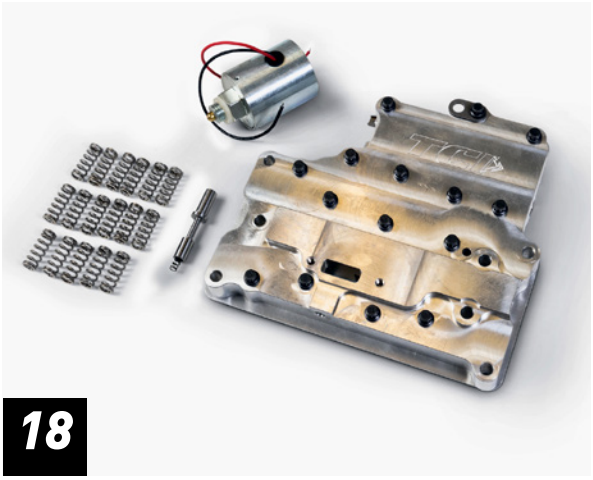

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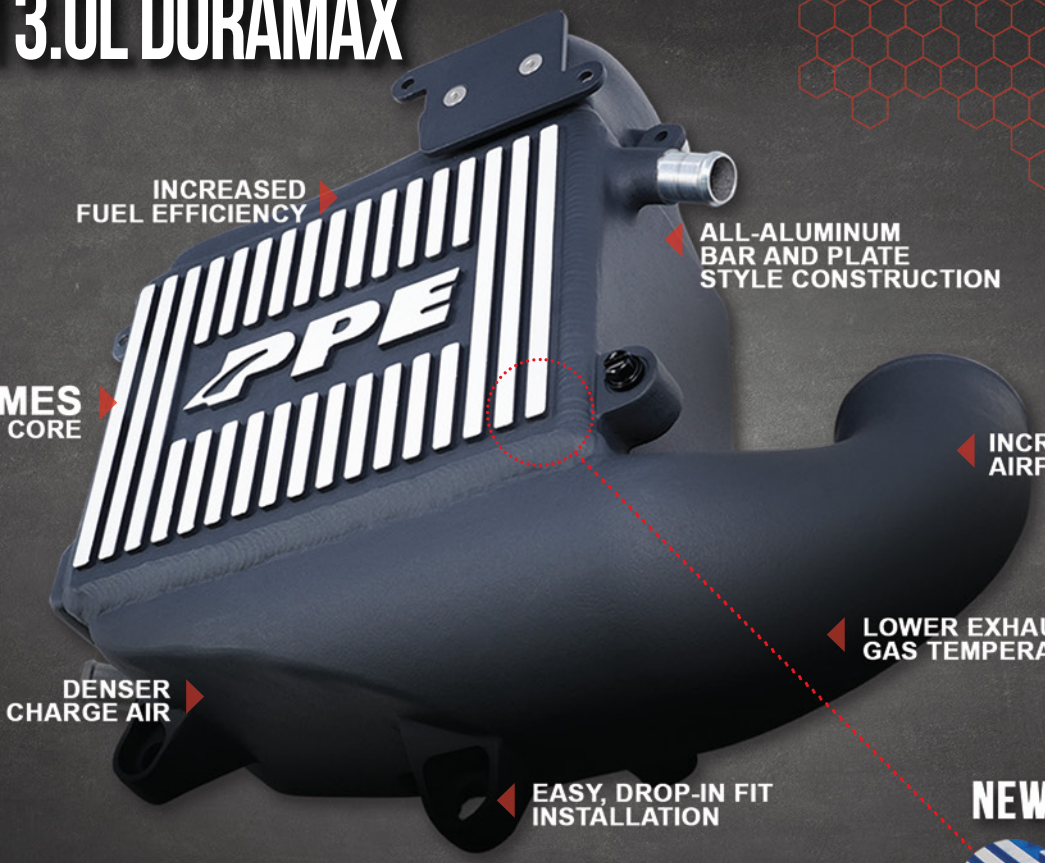

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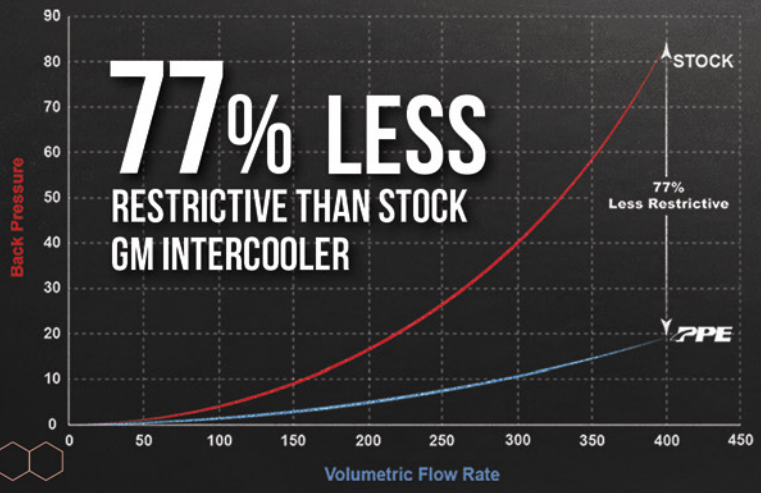

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CONTENTS

MAY 2023 VOLUME 38, NUMBER 5

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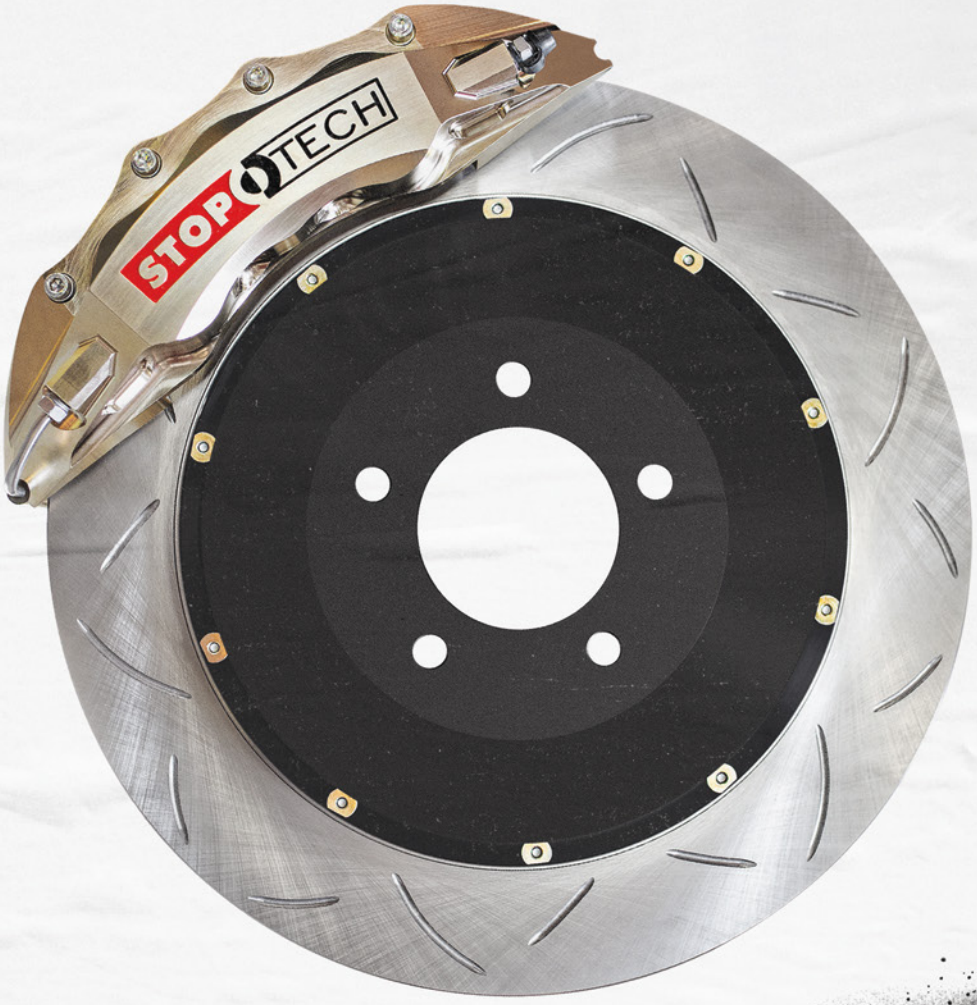
54

FEATURES

86

DEPARTMENTS



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FROM THE EDITOR

DAN SCHECHNER
dans@performanceracing.com

Two things I think ahead of this month's three-day Battle at the Border for World of Outlaws Late Models at Sharon Speedway in Hartford, Ohio (along with that IndyCar race at IMS on the 28th):

1) I THINK THERE AREN'T TOO MANY better ways to burn $500 than fielding a race car in the 24 Hours of Lemons. You'd just better be ready to face some stiff competition from the likes of "The Flying Blurritos," "Prince and the New Powertrain Generation," or my personal favorites, the "Half-Fast Racing" team (say it out loud). Since 2006, Lemons and its exceedingly modest buy-in has served as the high—or low—water mark for affordable endurance road racing. And a pretty damn good time, too, if you ask its participants. The idea being that it shouldn't cost an arm and a leg, or a second mortgage, to enjoy a day at the track. It doesn't have to be totally cutthroat, either. In this month's report titled "Going the Distance," ace contributor Bradley Iger spoke with organizers from four top budget-focused series—including Lemons' Jay Lamm—to learn what it takes to compete in their events. The piece provides an insightful look at how rule sets are established to minimize confusion and encourage participation. "The concept behind Lucky Dog Racing League has always been about being easy to work with," Cathy McCause Fuss told us. Classing based on the capabilities of car and driver ensure that races are evenly run. And each organization conducts safety tech inspections. But, when push comes to shove the end goal is still to provide a venue for racers without the barriers to entry associated with traditional endurance competition. Which means that whenever anyone threatens to seriously outspend and/or outrun the rest of the field, Fuss noted she simply "has to remind these teams that IndyCar is not going to be out there scouting you. You're racing for trophies made from car parts that look like dogs."

2) I THINK IT STANDS TO REASON THAT each part of the country offers a unique circle track experience. What may not be widely known, however, is how much these differences impact competition for one of the sport's premier segments. In case you were wondering, writer Drew Hardin's feature article "Local Variables" doesn't disappoint, capturing the nuances of dirt late model competition—and what's required to excel—from one region to the next. His story begins in the Northeast, where our source with the United Late Model Series highlights the variety in track surfaces, from dry and slick to those "where the cushion is 12–18 inches high." Then it's over to the Midwest, where five-time DIRTcar Late Model National Champion Bobby Pierce and Hall of Fame driver Ronnie Johnson reveal how tracks throughout the area impact their tunes and setups. "When we used to go to Brownstown [Indiana]," Johnson recalled, "I'd see guys make time actually driving the right-side wheels off the race track going down the straightaways because there was still traction out there, even though it looked like they were off the track." Covering the South, Southeast, and High Plains, too, Hardin's report contains further insights on car counts, race formats, engine rules, and more. Beginning on page 40, it's well worth the read. PRI

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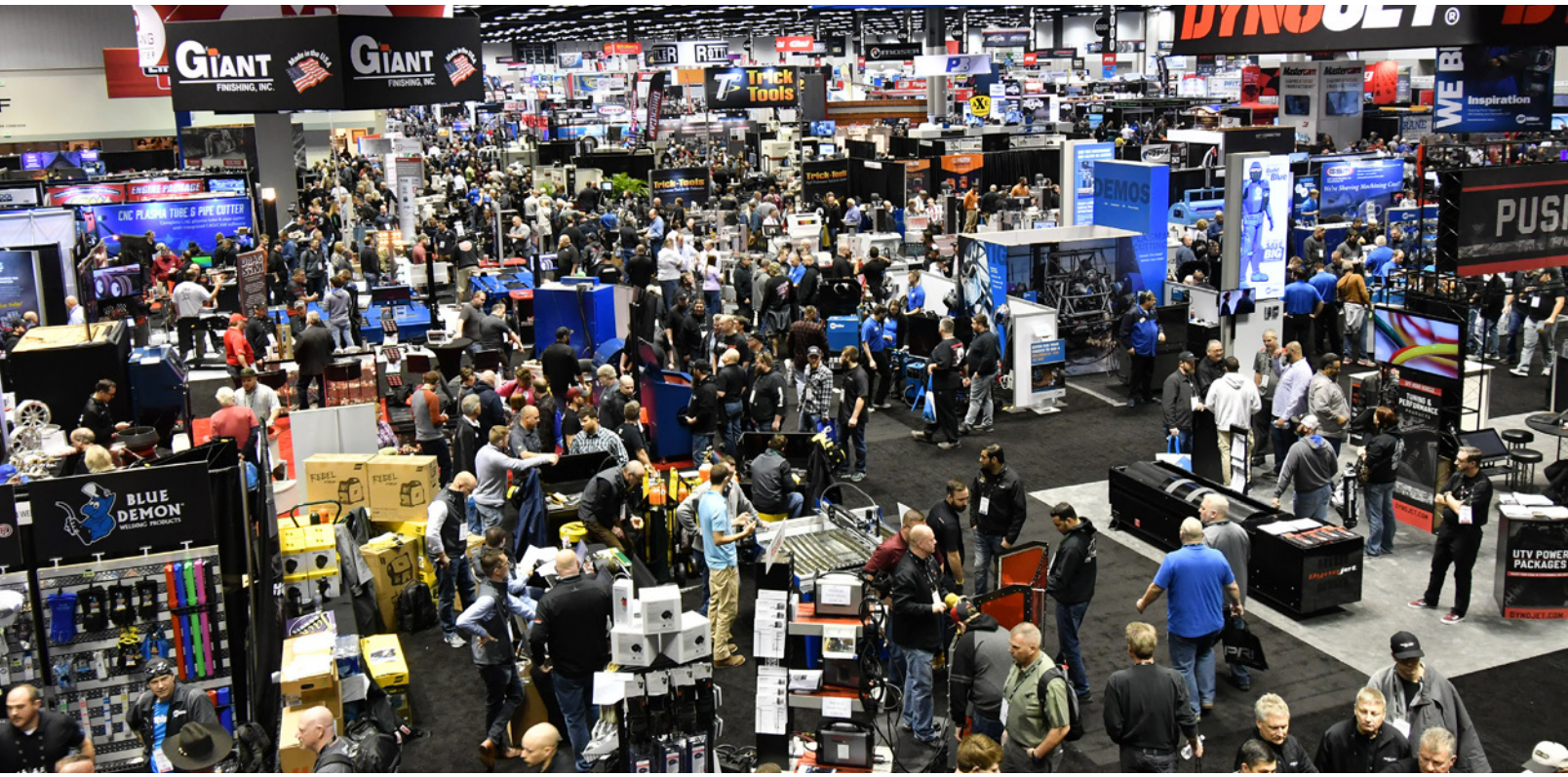

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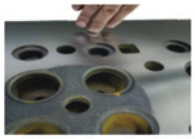

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CAR: Built by Scalar Performance

FEATURES: The gearbox is engineered by Ettractive for the SCR1 and has straight cut gears providing a 5.19:1 gear reduction. The suspension is developed by Öhlins specifically for the SCR1.

FACTS: For 2023, Scalar Performance will be selling 10 "Founder Edition" cars. "The hope is that these first 10 owners will work with us to optimize the car, and in return they will receive all hardware/software required to align their Founder cars with future production cars with hopes of running a spec series at some time in the future. Imagine having all the torque without waiting for rpm to build or boost to kick in. Imagine a race car with minimal motor maintenance. Those are some of the benefits of an all-electric race car," noted Brian Bourne, co-founder of Scalar Performance.

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RACE SERIES/CLASS: Debuts during the 2023 GridLife season

ENGINE: 20B 3 rotor engine was built and tuned in partnership with Daniel Kuo for Garage Life in Upland, California, and makes 1,100 horsepower

CAR: Features a handmade body kit from Japan by TCP Magic

FEATURES: Runs Pennzoil 10w60 synthetic engine oil; features an HGT billet six-speed sequential gearbox; bespoke KW Suspension; Rays 57XR Gram Lights wheels; Toyo Proxes R1R tires.

FACTS: Grunwald's brand and this car are featured in Microsoft's Forza video game series. When Grunwald isn't running his own program in the US, he moonlights working with Red Bull on Team Magic's Formula Drift Japan team with Mad Mike Whiddett.

ASK THE EXPERTS

OPTIMIZING SOCIAL MEDIA REACH

Effective strategies can make these digital networks a powerful marketing and promotional tool for your motorsports operation.

By Drew Hardin

Since it's just a click or a tap away, social media can feel like an easy way to promote a brand, a shop, a driver, or just about anything else related to the racing and performance industry. Yet because social media "is perceived to some degree as sort of free marketing, people spend a lot of time chasing the shiny, acting because they think they have to," said Jennifer Cario of SugarSpun Marketing, Bentleyville, Pennsylvania. "Maybe they read about a new trend in an online article, or a friend of a friend said, 'You gotta be on this channel.' They're doing it because someone said to do it, not because when they really looked at building out a strategy, it was the thing that made sense.

"People don't treat social media as another business decision," Cario added. "It has to be treated as a business decision with a strategy behind it."

WHICH PLATFORM?

Among the first steps in that strategy is determining which social media platforms will be right for a business. To answer that question, "the first thing they need to do is determine who their audience is," said Christen D'Alessandro, PRI's social media manager and senior editor. "What the business is and who their customer is will determine which social platform to use."

"PEOPLE DON'T TREAT SOCIAL MEDIA AS ANOTHER BUSINESS DECISION. IT HAS TO BE TREATED AS A BUSINESS DECISION WITH A STRATEGY BEHIND IT."

Using social media for a business "is a fun, backdoor way of advertising," said PRI's Christen D'Alessandro, seen here at work in the field. "You don't want to put a typical ad like you'd see in a magazine on social. That's not very exciting. People want to see exciting stuff."

To do that, Barry Alt of Motorhead Digital in Palmyra, New York, recommended developing a customer profile. "Who is your customer? What are their ages, income level, hobbies, things like that to really understand them?" Getting that information "is an easy email or phone call away. Talk to your favorite customers, the ones you would want all your customers to be like."

Customer demographics are important because the various social media platforms "cater to different demographics," D'Alessandro said. "Facebook is still the biggest platform overall in terms of users, so I think it's a given you should be on Facebook." But since it was one of the first main social media platforms, "it tends to be used by an older generation. To hit a younger demographic, TikTok and Instagram are the top two."

"We know that Twitter has among the highest usage rates for people of color and urban environments, as opposed to white Americans who live in rural America," Cario said. "If you are targeting older people that have a little bit more money and are doing something on a hobbyist basis, a channel like YouTube better fits that demographic."

"If you're a business building race cars or high-dollar engines, where do the people live online that have that kind of money? Who are they?" asked Alt. "Are they CEOs, CFOs, business owners? Are they even on Facebook, Instagram, or YouTube? They may only be on LinkedIn. LinkedIn is a social media platform as well, it's

In her PRI Education seminars, Jennifer Cario advises small businesses that they often post too often on social media. "You're working too hard, and you're shooting yourself in the foot. I'm actually telling you to do less work and you will accomplish more."

just more business oriented. We push our customers to set up LinkedIn business pages. Most of the time you can post the same things you're posting to Facebook, but you have to think differently about the post because the audience is different."

BRAND AWARENESS OR PRODUCT SALES?

While it's becoming easier to sell products through social media channels, "the need to build relationships on social media is more important than to sell stuff outright," Alt said. "Sales will come if you build those relationships. People do business with companies and people they know, like, and trust."

"Your brand needs to be out there for people to see your products," D'Alessandro said. "Even though you can sell through these platforms, it's important to have your name out there as much as possible and have people see your products on people's cars. People remember that, and that will help sell your products."

While it may be possible to sell directly through a social media platform, Cario said it's important "to be aware of the nuances of the different channels. For example, Facebook has said if a post directly sells a product, it needs to go up through Facebook advertising, not as part of the Facebook news feed. Facebook will downgrade your visibility in the news feed if you try to do the hard sell there."

QUALITY VERSUS QUANTITY

"If social media is done right, it's not as easy as people think," Alt said. "If you are just posting something and don't post it correctly, don't add hashtags, don't add copy to it—you're wasting your time. If you're doing it right, there's a lot of thought that goes into it. What are we going to say, and will it resonate with our followers? What hashtags are we going to use? When are we going to post? How often are we going to post?"

The "how often" question is key. "With this market, a good average is three to five posts a week," said Alt. Figuring that out can take "some trial and error. You need to look at page data and determine the interactions and see how many views, likes, comments, and new followers you're getting." Also, "post when people are actually online," he said. "When scheduling a post, META Business Suite will tell you when your followers are most active online. You can look at that and determine when will be a good opportunity for people to see your post."

"Quality is more important than quantity," D'Alessandro said. "If your followers start seeing a bunch of crappy posts, they might unfollow you. But it's still important to post enough to keep the brand out there. Personally, I would try to post at least once a day. If that's not possible, four to five times a week would be a decent amount."

Cario believes a business should "post the amount it can produce that's high quality, and content its audience is willing to engage with," rather than aiming at a set number of posts. In fact, she has found most small businesses post too much. If a platform's algorithm determines a user is seeing posts but not interacting with them, "the algorithm says, 'I'll show you less from that company,'" Cario said. But when "someone is putting out content and not getting the interaction they want, their gut reaction is to put out more content. That's kind of like meeting someone, being interested in them, and going, 'Okay, they're not returning my call, so I'll call them 47 times a day.' Now you're going to scare them off."

When she presents this way of thinking at her PRI and SEMA Show seminars, Cario said "most people tell me, 'Are you kidding? I can do less stuff and actually get more response from it?' Yes, you're working too hard, and you're shooting yourself in the foot. I'm actually telling you to do less work and you will accomplish more." PRI

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Motorhead Digital
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STOP DOING THAT...DO THIS INSTEAD

USING THE WRONG INSULATION

Vehicle layout and use-case can help determine which heat- and sound-dampening materials are chosen and where they're applied.

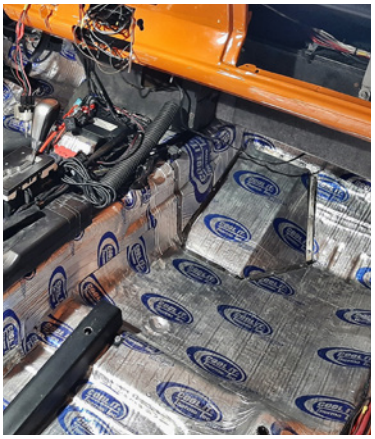
By Bradley Iger

Weight is typically considered the mortal enemy of performance, but there are instances where the compromise of a few pounds here and there can actually yield improvements at the track. Heat and sound control by way of specialized insulation and shielding materials are two such exceptions. While they won't benefit your power-to-weight ratio, these measures can improve a race program in a variety of different ways.

"One of those aspects is driver comfort," explained Mike Buca of Design Engineering, Avon Lake, Ohio. "Prolonged exposure to heat can worsen fatigue, and that can impact a driver's ability to concentrate and perform at the top of their game." Along with the ability to improve situational awareness around the car and effectively use communications systems, controlling and limiting noise can also have a measurable impact on driver comfort as well. "That's particularly useful in endurance formats."

Jeremy White of Thermo-Tec in Greenwich, Ohio, pointed out that controlling heat can also have a significant impact on vehicle performance as well as overall reliability. "Excess heat can cause anything from vapor lock to electrical shorts. There are a lot of different problems that can pop up when you overlook heat control."

Although some materials can address both heat and sound control, the type of product that should



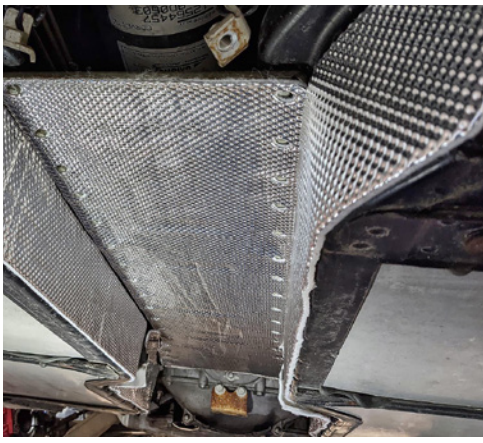
be used—and where it should be installed on the car—often comes down to application-specific factors. "There's some crossover between heat and sound control materials; a lot of the materials that we use for heat management will also reduce some sound transmission," said Buca. "But on both sides of the equation, there are materials that are better suited to handle one of these specific tasks because of their design. One of the most common misconceptions we see is that people will put a damping material down on the floor of the car and think that it's both sound and heat insulation, when in reality it's designed to control a certain type of sound. This material is a butyl rubber, so it's designed to absorb metal-born vibrations that transmit sound through the floor of the car. We put an aluminum layer on the top of it basically so that the rubber isn't sticky on both sides, but that really won't do a lot in terms of heat control."

> The aluminized face on the outside of Thermo-Tec's Cool It Suppressor mat "does help reflect heat and prolong the life of the material," said Jeremy White. "But we normally recommend also applying a heat shield in between that mat and the heat source so that each product can properly do the job it's designed to do."

> "A lot of race cars have bare metal interiors, and sometimes racers don't want to add interior insulation that might be a half-inch thick, non-woven material," said Mike Buca of Design Engineering. "In those cases, putting something underneath the car that reflects the heat away is a better option because it's much thinner and lighter."

Most damping material can also only be subjected to a comparatively limited amount of heat, White noted. "For instance, our Suppressor mat has an aluminized face on the outside of it, so it does help reflect heat and prolong the life of the material. But when somebody applies something like that, we normally recommend also applying a heat shield in between that mat and the heat source so that each product can properly do the job it's designed to do."

With that in mind, product choice often comes down to the particulars of a given application. "First you have to look at the car and figure out what you have access to in order to put down material," said Buca. "We'd use a different type of material inside the car than we would on the outside. A lot of race cars have bare metal interiors, and sometimes racers don't want to add an interior insulation that might be a half-inch thick, non-woven material. In those



Protecting wiring, cables, lines, and hoses is a good idea in any racing application, as underhood temperatures can degrade performance. Design Engineering offers various types of wraps and sleeves for underhood protection, sold in fixed lengths and also by the spool.

cases, putting something underneath the car that reflects the heat away is a better option because it's much thinner and lighter. That material can deflect the heat created by the engine, transmission, and exhaust system away from the floor pan or firewall, and that way it never makes it into the car."

The foot box and transmission tunnel tend to be areas of focus when the goal is to prevent heat from being transmitted into the cabin, but racers should take note of how the exhaust is routed through the car. "In a Trans-Am car, they typically run the exhaust up and above the back of the motor," Buca said. "That sends a lot more heat through the transmission tunnel than you'd typically see in a road racing car. But on NASCAR's Gen-7 car, the exhaust runs inside the door skin next to the rocker panel, right where the driver's left leg would be. So, it really depends on how the car is set up."

The amount of space you have to work with in a given area of the car can also play into which type of product is chosen. "For instance, with a land speed car you don't have a lot of extra room in the engine bay—everything's packed in very tightly, and there's not a lot of air movement," said White. "In that situation you need a very good shield to keep heat off of components, and that's where something like our Kevlar mat comes into play. It's thin and it can withstand higher temperatures than fiberglass products can. That's especially important when you're running an engine wide-open for a long amount of time."

White also said that adding protection to wiring, cables, lines, and hoses is a good idea in any racing application, regardless of the temperature ranges typically seen. "Even temperatures of a hundred degrees can start degrading performance when you start heating up things like the air intake and fuel lines. Cooler air and cooler fuel are going to improve performance, and with something like a drag car—where you run it for a period of time and then it sits with all of that heat trapped in the engine bay—things are going to be warmer than they initially were unless you're using sleeving that keeps those lines at the same temperature throughout the day."

Considering the expense of a race car build in the grand scheme, adding heat and sound control is a drop in the bucket. "Aside from a turbo shield, which can cost anywhere from $150 to $500 depending on the size of the turbo, a racer can do a pretty good job of insulating their car for around $400," Buca said. "You might double that if you're also doing sound insulation. It's not a big investment when you consider what you're getting out of it." PRI

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Design Engineering
designengineering.com

Thermo-Tec
thermotec.com

EDITORS' CHOICE

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

BRUSHLESS ALUMINUM POWERPACK COOLING FANS

DERALE

derale.com

Derale in Los Angeles, California, has introduced shrouded aluminum powerpacks with brushless motors and PWM control, now available in single- and dual-fan configurations.

"Brushless technology is the wave of the future," said Tom Longo. "There's more longevity, a lower amperage consumption, and the fans provide more cfm."

There are two single-fan powerpacks that feature a 17-inch puller fan and can provide up to 2,800 cfm. And there are three dual-fan setups with 12-inch puller fans that provide a total of up to 4,400 cfm. The units feature TIG-welded aluminum shrouds, a plug-in harness, and multiple mounting options.

"They're universal kits with applications in typical race markets as well as muscle cars and street rods," added Longo. "Cars in those markets need more cfm and may have limited space."

The fans all have integrated PWM control, which runs the fan from zero to 100%, depending on the cooling requirements. Sensors are available for 185-, 195-, or 215-degree max temperatures. Kits come with complete mounting hardware and an illustrated manual.

"Most race cars today, you flip the switch, and the fan is on all the time, and you're drawing power that you don't need," explained. Longo. "PWM will run the fan at the speed it needs to cool the engine. If you need 60%, get 60%." *—Mike Magda*

3FP PRESSURE SENSOR

TRENSOR

trensor.com

What better environment to test a pressure sensor than a 10,000-horsepower, nitro-burning Hemi engine?

"The first class of racing we partnered with was Top Fuel," said Kris Gilman of Trensor, Irvine, California. "Our thinking was, if these sensors can survive and provide accurate data, then we should be good for the rest of the classes."

For the first release of the company's new 3FP pressure sensors, there are seven part numbers with different pressure ranges from zero to 500 psi. More are expected to be released in the near future.

The sensors use OEM technology as the foundation and then apply added features, such as an atmospheric reference with a waterproof/dustproof membrane. This allows the sensor to automatically recalibrate with elevation changes.

Other features include standard three-pin APTIV electrical connection, standard 22-mm hex 1/8-27 NPT male mounting thread, and stainless-steel pressure port. The sensors are compatible with all popular racing data recorders and gauge clusters.

Gilman said the Top Fuel teams Trensor worked with would often have sensors fail within a race weekend. "They used ours and they wouldn't fail," noted Gilman. "We've received a lot of anecdotal evidence that supports that from motorcycle racers where there's a lot of vibration. Our sensors are rated to 40 G of axial vibrational force." *—Mike Magda*

MS8000 MAIN BEARING FOR 6.6L DURAMAX

DAIDO METAL USA

daidometal.com

Daido Metal USA in Farmington Hills, Michigan, is leveraging its motorsports technology in developing the MS8000 main bearing set for the 6.6-liter Duramax diesel engine.

"Daido was the OEM supplier for the original Duramax design," noted Dustin Kull. "The OE spec for that design was a lead-indium material."

The aftermarket version retains the lead-indium overlay plating on a bi-metal copper-lead alloy base. The bearing is also constructed using Daido's proprietary boring process that helps reduce oil leakage by eliminating the crush relief.

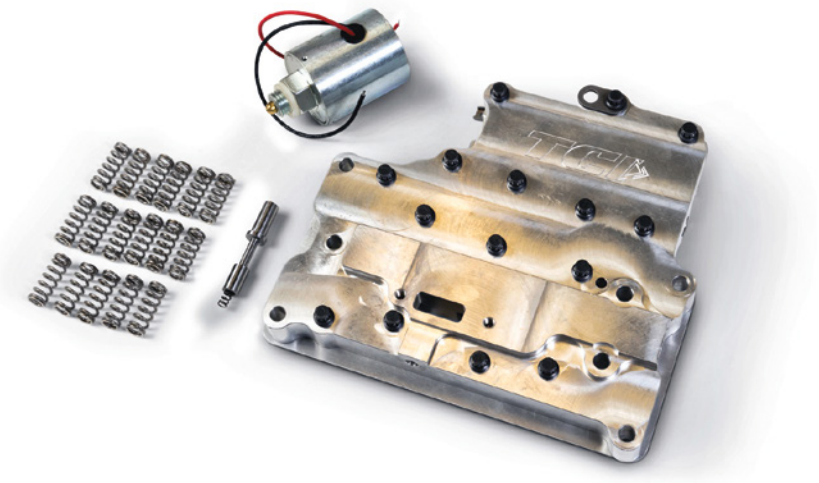
"This is especially beneficial on large-bearing applications," said Kull. "This design maintains oil film better near the parting line, compared to a conventional crush relief, which always loses oil film at the parting line. Saving that oil helps supply more oil to the rod bearings."

The lead-indium overlay on copper-lead alloy has been proven in Formula 1, World Endurance Championship, IndyCar, Moto GP, and other leading motorsports disciplines. Daido representatives said its materials offer a combination of conformability or softness to strength or hardness. Conformability helps the bearing surface adapt to load and shaft bending to distribute the oil film better. *—Mike Magda*

BILLET TRANSBRAKE VALVE BODY FOR POWERGLIDE

TCI AUTOMOTIVE

tciauto.com



The TCI catalog now boasts a new billet transbrake valve body for Powerglide transmissions.

"It's a new product for TCI," said Shane Pulido of the Olive Branch, Mississippi-based manufacturer, noting that it was developed with TCI engineer and racer Jeff Reed. "It hit so hard the first time he tested it that we had to bring down some of the power."

Constructed from billet aluminum, the valve body will show much less wear than a modified cast-iron factory unit. Other benefits include more consistency through precise tolerances, and it weighs less than a conventional unit. Another major feature is a Pro Tree design and heavier reverse springs for faster release.

"We developed it over six months," said Pulido. "We have a valve-body machine at work and were able to test it and make sure that the reaction times were as good or better than what was available before."

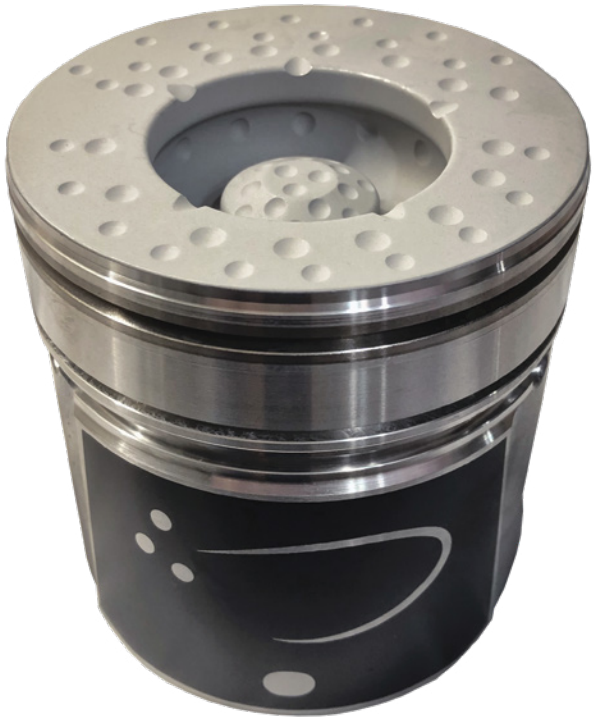
TCI also has a transmission dyno in its shop that can load up the torque converter with various load pressures and launch the transmission.

"Then we put it in a car to test at the track. That's three different ways we tested it," said Pulido. "One of the benefits is that we are using stock-style valves, so anyone can rebuild it themselves. It's very racer friendly." *—Mike Magda*

HYPERFORMANCE PISTONS

SPEED OF AIR

speedofair.com



Developed to enhance the efficiency of medium-duty diesel engines, Hyperformance Pistons featuring Speed of Air's patented technology is also finding success at the drag strip and on the dirt track. Speed of Air (SoA) in Reno, Nevada, has licensed the technology to United Engine and Machine (UEM).

The SoA technology consists of precise, CNC-machined indentations on the piston crown called turbulators. Also known simply as dimples, these turbulators create a thinner, well-attached boundary layer between the air-fuel mixture, its flame front, and combustion chamber walls, allowing the flame front to burn closer to the cylinder walls. According to a two-year test program by a large diesel engine remanufacturer, the results show a reduction in fuel consumption, reduced emissions, and increased power.

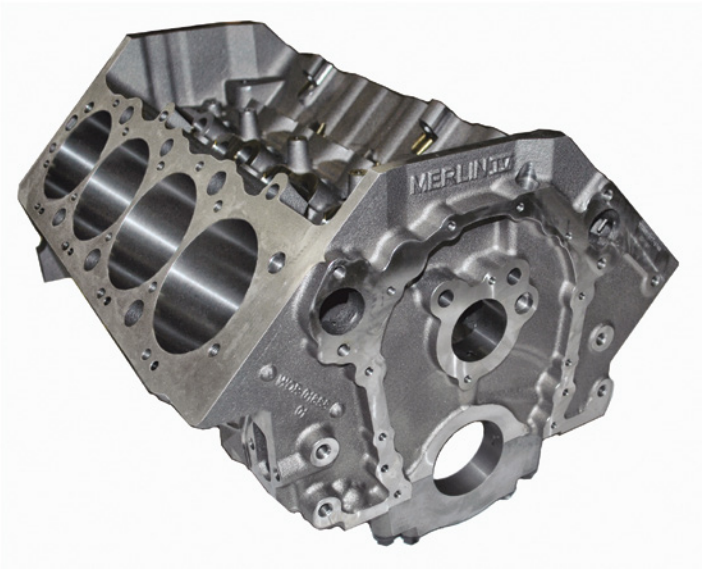
In addition to the diesel applications, some of this technology is being run in competition. IMCA dirt modified racer Bobby Hogge IV is a major event winner in California, and Daniel Schierholt runs a 506 Mopar-powered dragster at the strip. He set up a straight A-B test with his engine, replacing only the pistons while keeping the same compression ratio.

"Even though I lost a little at the 60-foot, the car gradually picked up all the way down track," said Schierholt. "The car also began to use less methanol during these passes, which to me is a testament to the more complete burn we are seeing during the combustion process." *—Mike Magda*

MERLIN IV CYLINDER BLOCK

WORLD PRODUCTS

pbm-erson.com



The Merlin IV iron big block Chevy cylinder block from World Products in Louisville, Kentucky, has been available in numerous deck heights and bore sizes for some time, and now special features like billet main caps, 55-mm cam bores, and .904-inch lifter bores are offered in the catalog.

"Before, you either had to take it to a machinist or special order those features," said Jack McInnis. "We had a lot of requests for those features, so we decided to make it a stocking part number."

Cast with thicker main webs and thicker cylinder walls than previous Merlin blocks, the Merlin IV also features front oil feed for dry-sump systems and relocated oil feeds and restrictor provisions to the front of the block.

The Merlin IV can be ordered in conventional deck heights of 9.800 and 10.200 inches, with either nodular iron or billet-steel main caps. It's also possible to get them in a Gen VI configuration with a one-piece rear seal. Bore sizes range from 4.250 up to 4.595 inches

The block is also available in deck heights of 9.500, 9.850, and 10.250 inches. Most blocks come with standard cam journals of 2.120 inches and .842-inch lifter bores. However, some blocks are available with 2.283-inch cam journals that support 55-mm Babbitt bearings and .904-inch lifter journals.

"These blocks are really popular with sportsmen drag racers," added McInnis. *—Mike Magda*

HOT ROD TIES

HEATSHIELD PRODUCTS

heatshieldproducts.com

Plastic ties are often used to secure wrappings, wiring, and other components on a race car, and lately the quality of these ties hasn't been up to the task, especially in a high-temperature environment.

Heatshield Products in Escondido, California, has now developed Hot Rod Ties from a specially formulated plastic that can withstand radiant heat exposure up to 220 degrees F.

"Hot Rod Ties allow you to quickly secure items near heat sources without fear of them failing," said Cole Quinell. "You can even use them to secure heat shielding over wires and fuel lines, which is very helpful in areas that you may need to open up frequently."

These American-made ties are available in .14-, .18-, and .30-inch widths, and also in 8-, 11-, and 15-inch lengths.

"These are a staple in the racers' tool box for quick fixes and are often used in areas that you need to get into frequently and quickly. Poor-quality plastic ties melt or become heat-soaked and brittle easily," said Quinell. "Before Heatshield Products releases any product for sale, it tests it with racers of all types. The feedback has been great. Hot Rod Ties are made specifically for automotive applications. That means they are available in sizes and pricing that makes sense for a racer." *—Mike Magda*

FAST MOVERS

A look at some of the country's in-demand motorsports products and services by region and racing segment.

Edited by Laura Pitts

Motorsports retailers and service providers are constantly tracking the latest parts and trends to give their customers a competitive edge. For the latest on which products and services are moving the retail needle, we present the following sales snapshot from shops across the US.

COMPETITION MOTORSPORT

Austin, Texas

As one of the retailers situated near the Circuit of The Americas (COTA), Competition Motorsport primarily sells road racing and high-performance driving event (HPDE) safety components, Nico Watkins told us. "A lot of people are getting into HPDE here but don't want to rent a helmet, so we're selling a lot of Stilo ST5.1 GTs," available in composite or carbon fiber, with the option to add communication capabilities, custom visors, and top-air cooling systems. "Stilo is one of the few companies doing a great job of keeping products in stock right now. Other good examples are Alpinestars and Sparco," Watkins said, pointing to a large amount of inventory ready to ship.

Another standout is actually one of the company's newest offerings: the forced air FluidLogic Coaxial System (pictured), a hydration and forced-air combo that keeps drivers comfortable during long races. It provides air, but the biggest selling point is its ability to "communicate" to the driver when it's time to hydrate—and even shoot a pre-determined amount of water straight into their mouth.

"You just press a green button on your steering wheel. It keeps your mind on racing," Watkins explained. "The big challenge in endurance racing is driver changes. Getting these to be quick is tough, but the cool thing about this FluidLogic system is its easy magnetic connection. You put the tube close to the driver's head and click, hydration and cool air are set. It takes a process that's normally 15 seconds down to about one second."

HAMMER'S PRECISION

Deltona, Florida

This engine builder and rebuilder—located about a half hour from Orlando Speed World in Florida—sees "a lot of Corvette racers from Sick Week and Drag Week. Our No. 1 seller is something we call our 1,000-hp package (pictured) primarily for the C7 ZO6," said owner Ryan Hammer. "We'll replace the stock GM supercharger with a Magnuson, which comes with a 95-mm pulley. This only makes about 13 lbs. of boost—not enough to take it to 1,000 hp, so we change the pulley to a GripTec 80 mm, which makes 19 lbs. of boost. Then we use Speed Engineering & Performance 2-inch primary headers and X-pipe kit. We also add a flex fuel sensor to have the ability to run E85 and add a DSX Tuning auxiliary fuel pump to feed enough fuel to support the horsepower level. After this, we typically see

between 1,040–1,060 hp on a Dynojet."

The package features some additional dozen-plus parts from brands like Texas Speed & Performance, PAC Racing, Manton Pushrods, CHE Precision, and ARP. "We've been getting these [components] from Texas Speed. I'm a very proud dealer for them and work with them closely on different camshaft choices depending on our customers' needs. They're fantastic."

Package customers are typically running the quarter-mile with a time of 9.32–9.45 seconds at 148–152 mph, Hammer said, but are also having to upgrade to beadlock wheels to prevent them from spinning inside the tire from the increased power. "We recommend WELD Wheels," Hammer said.

RACERS SAFETY SOURCE

Irvine, California

This SoCal driver-safety retailer tabbed helmets as some of its fastest movers when we recently connected with owner Chris Emery, who pointed to Arai and Schuberth (pictured) as the most popular brands right now. "Depending on what you're driving, your body takes a lot of strain around the neck. With a heavier helmet, you can tend to get tired more quickly. So, I suggest lighter helmets that allow them to enjoy the sport a

bit more," Emery said.

Customers—mainly road racers and endurance drivers, but off-roaders, too—are also buying up driver suits like Alpinestars Hypertech v2, Alpinestars GP Tech v3, or the Sabelt Hero Superlight TS-10.

"I've been working with a lot of newer drivers who are asking questions about pricing and why a suit or helmet would cost less than a more expensive one," Emery added. "Educating the customer on the benefits of particular products has helped move more carbon fiber helmets and lighter, more comfortable suits." PRI

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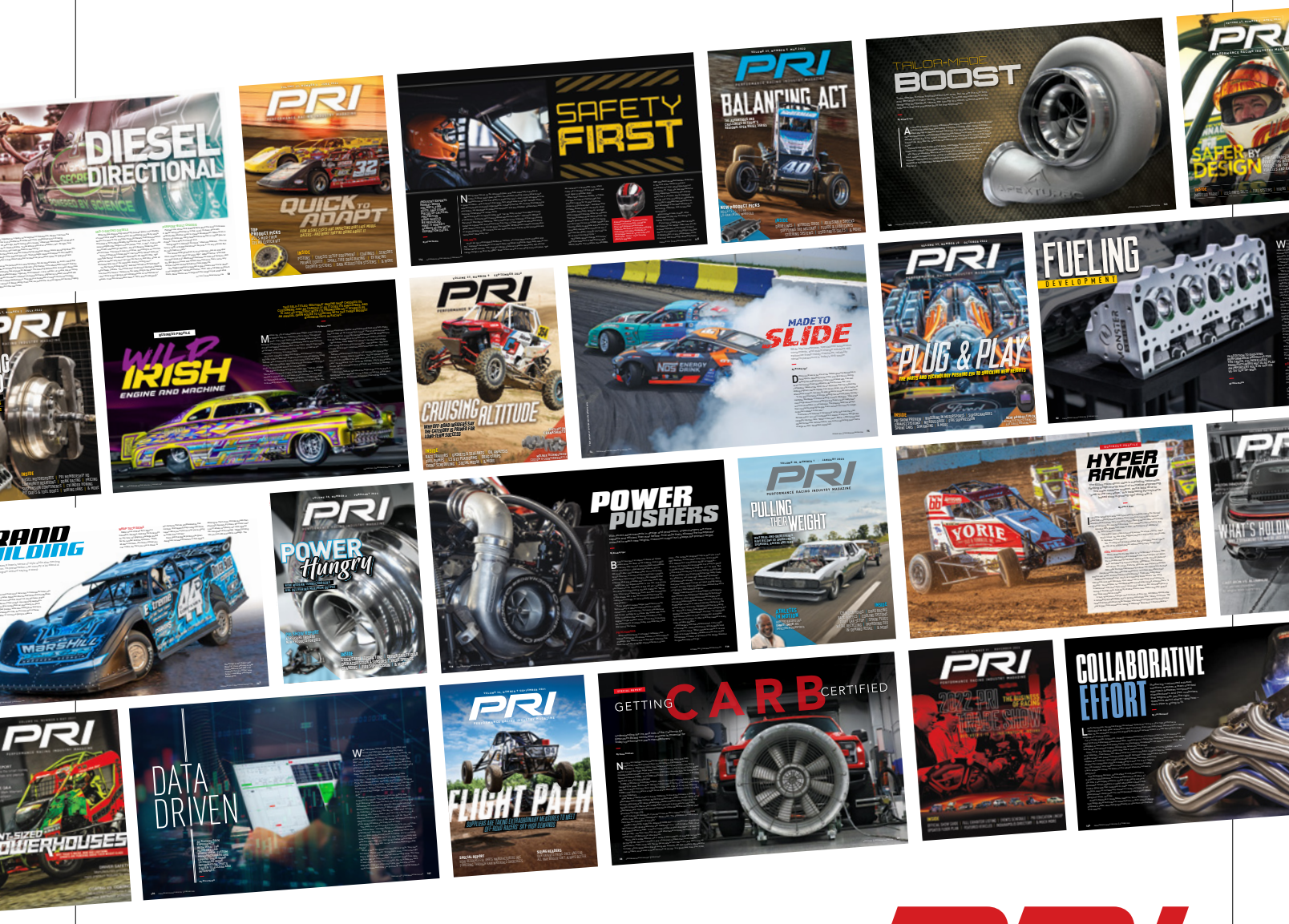


THE BUSINESS OF RACING STARTS HERE!

PRI
PERFORMANCE RACING INDUSTRY

NEWLY APPOINTED

RUBEN MIRELES

The new announcer for the World of Outlaws CASE Construction Equipment Late Model Series has been calling dirt races since he was 12. Needless to say, he's more than ready for this latest opportunity.

By Jim Koscs

The World of Outlaws CASE Construction Equipment Late Model Series named Ruben Mireles as its new series announcer this past December. He started in his new role during the Sunshine Nationals at Volusia Speedway Park in De Leon Springs, Florida, in January. Mireles previously served as a pit reporter for the World of Outlaws CASE Late Models and has been the DIRTcar Summer Nationals announcer for the past five seasons.

Many may know Mireles as "The voice of the Southwest" who started professionally announcing races at El Paso Speedway and Southern New Mexico Speedway in 2012, at age 13. He had called his first races just before his 13th birthday. A series of hard-earned steps took him to the regional stage and beyond.

Speaking with PRI Magazine recently, Mireles was quick to credit a "Who's Who" of dirt racing for taking a chance on him, for presenting opportunities, and for offering encouragement and mentorship. That includes especially Rick Eshelman, the World of Outlaws announcer who passed away in October 2022.

From six years old, Mireles and his father were fixtures at El Paso Speedway. As a boy, Mireles immersed himself in the sport and spectacle of dirt racing. He studied the drivers and cars and tracked their careers. He absorbed what he heard from the announcer at both tracks, Bryan Hulbert, never having a thought that he would one day step into that job.

Here's how Mireles looks at his career.

PRI: You started announcing dirt races when you were just 12, which seems incredible. What was the spark that got you into racing?
Mireles: Instead of watching TV and movies as a kid, I got hooked on watching NASCAR on TV at six years old. The first race I saw was from Talladega, where Jimmie Johnson came from the back to win. I was hooked! I told my dad, "We're watching NASCAR every Sunday."
PRI: What's your first memory from a track?
Mireles: When I was six, I spotted a big ad in the local paper for a NASCAR race coming to El Paso on July 4. It was May, and I told my dad I wanted to go. No one in my family followed racing. I was the only one. But we went, and it was great. There were sprint cars, X-mods, all sorts of classes. I wanted to go every weekend, and we did, to El Paso and to Southern New Mexico Speedway. From watching in the stands for six years until I started announcing at 12, I think I missed just two race nights, one at each track. Through all those years, my dad took me to all of them.
PRI: Did you think about one day getting involved as more than a spectator?

RUBEN MIRELES

TITLE:
Series Announcer

ORGANIZATION:
World of Outlaws CASE Construction Equipment Late Model Series

HOMETOWN:
Anthony, New Mexico

FAST FACT:
Ruben Mireles is also a musician. "I was in marching band in high school and my whole five years at New Mexico State. I played saxophone and, for my two final years, I was one of the three drum majors, the highest leadership position in the marching band."

Mireles: I told my dad I would love to race one day. He said, "That's a little expensive." An older couple that would always sit two rows in front of us at El Paso rooted for the #12 car in the modified division. He was always toward the back, but he was a good racer. My dad said, "Let's sponsor this guy." His masonry company did, and he ended up winning the championship at Southern New Mexico Speedway the next year.
PRI: Did that make you want to race?
Mireles: It did. But the racer suggested that I might be better at writing the racing program. He knew I didn't root for just the biggest names, that I always liked to get the inside story on all the drivers. I was just 12 years old, not even in high school.
PRI: How did you end up behind the microphone?
Mireles: A lady named Candace at Southern New Mexico Speedway used to walk me down to the pits to meet the drivers and get autographs. She knew all the officials and introduced me to Bryan [Hulbert] and his parents, who were doing race directing. She said to Bryan, "I know someone who'd love to do your job." I couldn't believe it, but they let me call two four-lap $100 trophy dashes the following weekend. I blew the roof off the place, and it didn't even have a roof!
PRI: How quickly did things escalate from there?
Mireles: At the last race of the

season, Bryan announced he was leaving to announce the ASCS National Tour. Royal Jones, who owned El Paso and Southern New Mexico Speedway, hired me as announcer for both tracks in 2012. I did that through 2017.

PRI: Did you have the gift of gab as a boy? Did anyone ever suggest this line of work to you?

Mireles: I was a shy kid in elementary and middle school. I was in band. But announcing instantly became a love and a passion for me. Now you can't get me to be quiet.

PRI: How did you make the jump to regional announcing?

Mireles: In August 2012, Cory Moul, who owns the CLMA [Colorado Late Model Association] DIRTcar series, asked me to go to Arizona to announce a 74-lapper at USA Speedway in Tucson. Then I did races at other Arizona tracks. People started calling me "The Voice of the Southwest," and I started doing more CLMA races. I traveled all over with them.

PRI: That was still in your first year as an announcer?

Mireles: Yes. I started high school in 2013. So, I was a regional announcer and local announcer, and I also had an after-school job at Garrett Alberson's Late Model shop until I was 16. I was working on the tires, but also learned some body work, suspension, and helped take apart engines.

PRI: How did you get the DIRTcar Summer Nationals gig?

Mireles: I did the Arizona Mod Tour and the Winter Extreme in 2014 and met Rick Eshelman. He heard me work and said, "You're pretty good." We exchanged numbers, and we'd talk occasionally. In December 2017, I met him for lunch when he was delivering a car to Arizona. He said he was leaving the Summer Nationals to focus on the Outlaws. He asked if I'd like to take over. I thought, "Holy cow, this is a dream come true!" I started the Summer Nationals in 2018 and did that for five years.

PRI: Let's talk a little about the work. When you started announcing, did some people not know that you were so young?

"THE DRIVERS ARE ALWAYS THE SHOW. THE ANNOUNCER IS JUST A PART OF IT."

Mireles: At the beginning, there were some bad comments on YouTube and Facebook, but Royal Jones would go on and tell them, "He's only 12 and trying." One of the first lessons I learned is to stay positive and to take constructive criticism.

PRI: Since you started announcing at 12, there's the understandable question—how did you handle your voice change?

Mireles: My voice began to crack during a race. I got through it. For a while I wasn't confident in my voice, but I am now.

PRI: Can you share a mistake that you've learned from?

Mireles: Yes, speaking before having all the facts. I was announcing a Summer Nationals race at I-96 Speedway in Michigan. A racer blew something, and there was white smoke coming out of the car. I automatically announced, "The engine blew." It turned out to be the rear, not the engine. I realized that my comment could have made the engine builder look bad. Today, I would just say, "Something went awry on that car, and we'll try to find out what happened."

PRI: How would you describe your announcing style?

Mireles: I never tried to imitate anyone. I kind of took little bits and pieces I liked and put it into my own memory bank to create my own style. I just go with a flow and the enthusiasm kicks in.

PRI: Aside from Bryan and Rick, are there any other announcers who influenced you?

Mireles: Royal would always tell me to listen to Johnny Gibson [the voice of the World of Outlaws Sprint Cars since 1997]. He loved the way Johnny explained things for the fans. So, that's what I do. I always go down to the pit to get the drivers' hometowns, engine specs, and all their sponsors. I share the information with the fans to give them more engagement. When you create engagement, that makes them want to come back.

PRI: That sounds like a marketer talking.

Mireles: I graduated New Mexico State University with a Bachelor's degree in marketing and a minor in sports marketing and advertising. I love marketing. it fits well with announcing.

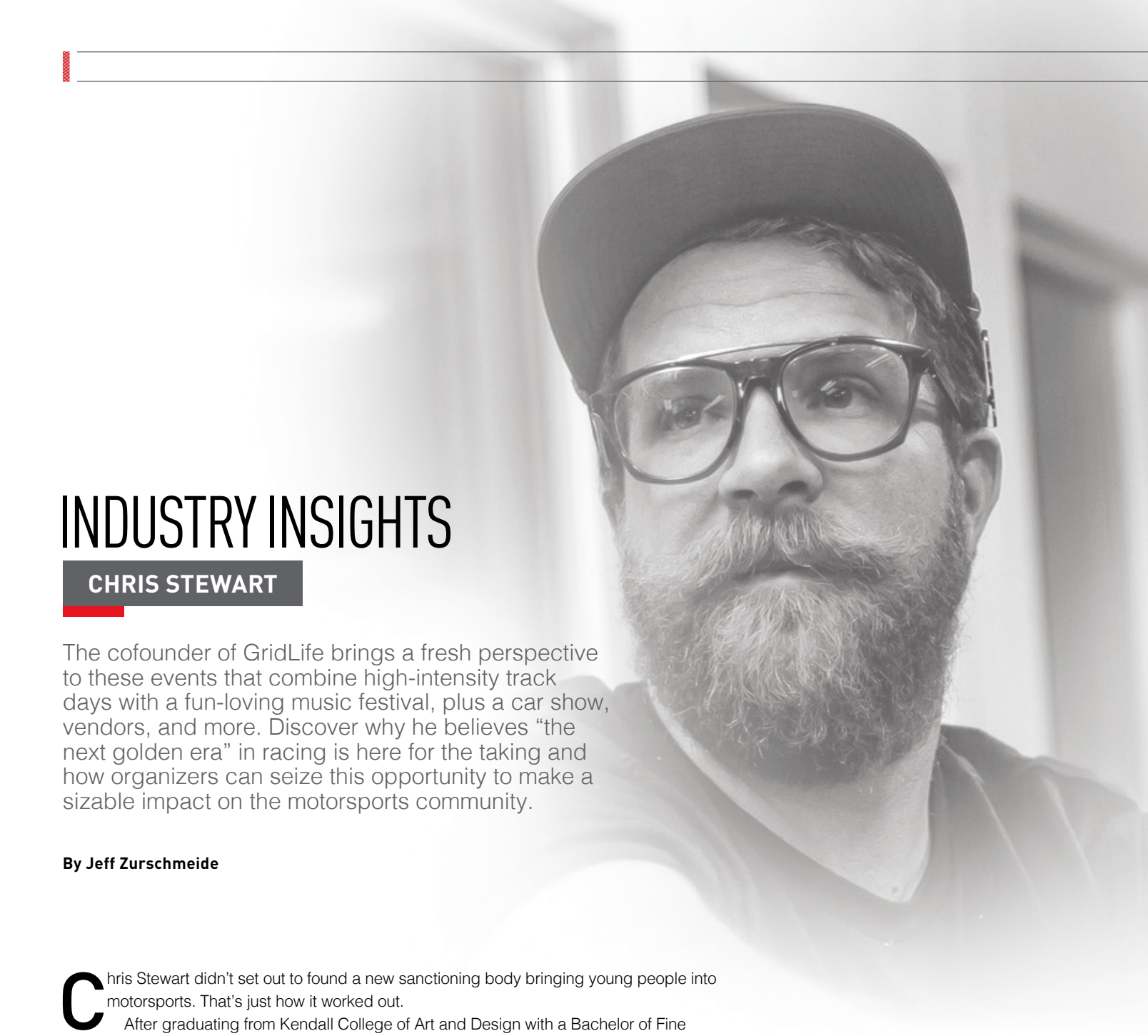
PRI: By the time you started college, you already had five years into a professional announcing career. What motivated you to continue your education?

Mireles: When I did the Winter Extreme, which is now the Wild West Shootout, I said to [DirtonDirt.com co-founder and general manager] Michael Rigsby, "Michael, just give me a full-time job. I'm ready to announce all your races." And then Ben Shelton [now at MyRacePass] said to me, "Ruben, slow down. You don't know where you'll be in 10 years. You've got to go to college. You need something to fall back on." I was never a straight-A student, but I loved school. I love learning.

PRI: At World of Outlaws, you're taking the place of a legendary announcer, and a man who was a personal mentor and friend. How do you remember Rick Eshelman?

Mireles: Rick is my announcing hero. He got me to where I am now. He always motivated me, but he could be tough when I made mistakes. He'd say, "Ruben, you're better than that!" He was always trying to make me better. One day he told me that the day he retired, he'd tell me three big things that he learned from me. I'll never get to know those things. It breaks my heart.

I've got big shoes to fill, and I'm going to work my tail off to fill them as best I can. The drivers are always the show. The announcer is just a part of it. Whether it's a weekly show, an enduro, or the World 100, I am always going to give the fans 100%. PRI



INDUSTRY INSIGHTS

CHRIS STEWART

The cofounder of GridLife brings a fresh perspective to these events that combine high-intensity track days with a fun-loving music festival, plus a car show, vendors, and more. Discover why he believes "the next golden era" in racing is here for the taking and how organizers can seize this opportunity to make a sizable impact on the motorsports community.

By Jeff Zurschmeide

Chris Stewart didn't set out to found a new sanctioning body bringing young people into motorsports. That's just how it worked out.

After graduating from Kendall College of Art and Design with a Bachelor of Fine Arts degree, Stewart went to work in the advertising business, rising to become the senior art director for Harley-Davidson as well as holding a series of creative director posts.

It might seem like a strange turn, but GridLife was a natural outgrowth of Stewart's twin passions for cars and marketing/communications. "It's kind of a combination of my automotive enthusiasm plus the things that I was thinking about in my professional career in advertising. I ultimately smashed all of those things together to create GridLife," he said.

"I LIKE THE WAY THAT FESTIVALS BUILD COMMUNITIES FOR A MOMENT IN TIME. SO I TOOK THAT FEELING AND THAT INTENTION AND APPLIED IT TO A TRACK DAY."

For those who haven't seen it, GridLife combines a track day and livestreamed racing with a car show, music festival, vendors, and food. Of course, all that didn't just spring to life from an idea. Stewart had been organizing car events since he was in college, together with his business partner Adam Jabaay. "We met because I left a concert and saw this slammed 1989 Honda Civic in the parking lot. I left a note on that car asking if they needed any parts. They called me and that was Adam."

Even when he was working a high-powered advertising executive job in Chicago, Stewart was still in the motor hobby as much as he could be. Today, GridLife takes all his attention as he tries to stay on top of its explosive growth nationwide. We caught up with Stewart on a rare day when he was actually in his office.

"WE TRY TO FOCUS ON THE CORE AND AUTHENTIC COOL THINGS THAT ARE IN ALL THESE DIFFERENT SEGMENTS AND GLUE THEM TOGETHER WITH A FESTIVAL EXPERIENCE."

PRI: What gave you the idea to combine a track day with a live music event?
Stewart: I was looking at all these different sub-divisions within my friend groups. I've got people who are into drifting and drag racing or just the street scene and cruising around on Fridays, and I'm in the track scene. I was just thinking, how do I get more of my friends to come to the race track? Simultaneously, the festivalization of a lot of different things was happening. I'm a huge music fan and go to tons of festivals—I'm kind of a Deadhead and a Phishhead. So I'm a fan of cult-like music communities, whether that's dance music or jam bands or whatever.

I like the way that festivals build communities for a moment in time. So I took that feeling and that intention and applied it to a track day. The thinking is, if I'm driving on the track, that's a great weekend. But if I'm not driving and I go, even though I'm into cars I'm done in an hour or two hours. You kind of fade out of attention span.

So I wanted to build an event you can bring anybody to, even if they just have a little bit of car curiosity. We're going to try to crosspollinate as many things as possible. That was really the idea, to get all the cool stuff and cut the corny things out of car culture. We try to focus on the core and authentic cool things that are in all these different segments and glue them together with a festival experience.
PRI: What makes a GridLife event special?
Stewart: If you ask us what our product is, we sell community between individuals with a similar passion. It can take the form of wheel-to-wheel races, or time attack racing, or a track day or drift experience or whatever. But when it all boils down, we're really trying to build this experience for people to come together with their friends and create new friendships. That's paramount. I can't tell you exactly how we do it or what the specific touchpoints are that make us different, but that's the thing that we're very focused on. Maybe the youth term is, it's all about the vibe. That's a word that gets chucked around probably a little bit too much. But we use that as a point of measurement.

There's a bit of growing pains with us because our series is professionalizing at a very rapid rate. So we're playing defense just to make sure that we don't overstep the line from an accessibility and a tonal perspective; we don't want to go too far. It's a little bit of a dance: How pro is too pro? Not to accuse anybody, but the first track events that I went to were intimidating. It took a long time for me to break through. It never felt like a real open environment. It wasn't closed necessarily, but there was some gatekeeping. Some rules are there for safety, but we are very conscious of how everyone is treated.
PRI: Can a driver get serious about competition in GridLife?
Stewart: You can come in from another organization, or if you've been doing track days, you can come to GridLife, and we can figure out where you are and adjust the curriculum to get you to where you want to drive. It's gotten harder to keep HPDE [High Performance Driving Events] as a core part of our festival weekends because the competition part has gotten so intense.

So what we've done this year is create two different types of events. We've got what we call our festival weekends, which are competition focused. The competition is Friday and Saturday, it's competition only, but then Sunday is just an HPDE all day. After the competition winds down, if you came to spectate, then you get your opportunity to be on the track.

We also have a new program called Single Session for first-timers. It's a little taste of a track experience at a lower cost. It includes a full classroom session, a drivers' meeting, and then it's three cars per instructor running 6/10ths "duckling" laps. You can do that for 70 bucks and drive on the race track. This allows people to get a taste of it, and then they can jump a little bit further.
PRI: How are you going to get the next generation of drivers into your organization?
Stewart: We're always thinking about different ways to get people in. I think eSports and gamers in general are a big focus for future drivers. When you think about people who are technical enough to get into the automotive hobby, especially in a tuning and racing capacity, I think gamers index pretty high. They like customization, and they like competition. We're also thinking a little bit further ahead about who has the ability to become car-curious and ultimately become either fans or participants.

GridLife combines a track day and livestreamed racing with a car show, music festival, vendors, and food. "I wanted to build an event you can bring anybody to, even if they just have a little bit of car curiosity," said GridLife founder Chris Stewart.

PRI: Let's talk about the GridLife community. What are the demographics of a GridLife event?
Stewart: GridLife is 10 years old now, which is really wild to say, and some of the core demographic is getting a little bit older, but the core of our drivers are about 24 to 41 years old. I would say that represents 90% of the driving pool, and then our spectators are maybe 23 to 32 years old. There's a demographic that's a little bit younger than that, and another that's a little bit older, but that's the core of it.

Everyone in the industry has been hammering on getting young people into racing for the last five years to a decade. I feel like it's actually starting to click now because we're all collectively attacking the same thing. Now we're seeing more young people come into it. I think the rise and the dramatization of Formula 1 is helping put a spotlight on racing in general. I feel like this is our opportunity to push the next golden era.
PRI: What has to change to make that golden era happen?
Stewart: I watched the NASCAR Clash at the Coliseum. I saw a lot of young, hip people watching NASCAR. But when I go read the posts online about it, I see a lot of gatekeeping and a lot of anchors in the ground about trying to do something different or adjusting things to try to appeal to somebody other than a traditional racing fan. The point is, I think NASCAR is making some very interesting and appropriate moves in its efforts to reinvent the sport. I think we definitely need to adjust what we're doing. There are a lot of ways to remix and present motorsports and the culture of cars. A lot of times, much like some peoples' perspective on the Clash, you're going to swing hard and miss. But it's to your advantage to take that swing and see what works and what doesn't.
PRI: Are you optimistic about the future of racing?
Stewart: I think we're in a really interesting time of transformation in motorsports. Participatory motorsports feels like it's on the rise. I know we talk about race tracks closing down, but it also feels like there's a lot of race tracks being built. We've got a demand problem at our events. Watkins Glen, Mid-Ohio, Lime Rock, and the GingerMan events all sold out in three minutes. Now we have 200

"We sell community between individuals with a similar passion," said GridLife's Chris Stewart. "It can take the form of wheel-to-wheel races, or time attack racing, or a track day or drift experience. We're trying to build this experience for people to come together with their friends and create new friendships."

drivers who wanted to drive and can't. That's a great problem to have, but I don't want them to be disappointed. I'd love to let them all drive, but there's only so much space.

PRI: How do you plan to grow your business to the next level and meet that demand?

Stewart: If you figure it out, you let me know! I've been reading a bunch of stuff about leadership and business cycles, and I think the point we're at right now is the pre-execution phase, where you're in process. Up until this point it was, "Let's do what's cool." I know how to build a thing, so let's build it. But now it's gotten to the point where we're at this scale where that becomes harder. It's harder to get ideas off the ground because of the volume of things that we're doing.

We're in the sanctioning body business with an ancillary events production business, which are the two halves of it. Event production is a hard business, and sanctioning bodies are usually volunteer-based, so they're barely a business at all!

Chris Stewart's path to GridLife included a stint as a senior art director for Harley-Davidson and advertising agency creative director posts. "I ultimately smashed all of those things together to create GridLife."

Chris Stewart calls himself a "huge music fan" who often attends music festivals, and he wanted to bring that sense of community he feels at festivals into the GridLife track day events. "Maybe the youth term is, it's all about the vibe."

There's no margin, especially when you're trying to keep costs low and the events accessible. I don't totally have the answer yet, but our strategic structure is we're trying to build this Festival Tour, which is six events now and will theoretically be a maximum of eight events. Those are going to be our big pushes, so those are the events that are going to get all the sauce; everything that we do.

We're planning on those eight "tent pole" events and then two to three support events that allow the community to be engaged. That's what we're now calling our club weekends, with more of a track day focus that's a little bit more relaxed. It's just about the drivers. You can come spectate, but it's not produced as a spectator event. Overall, we're trying to find sustainability with all the stuff that we do. It really comes down to having strong partners in brands that believe in what we do and who want to support that vision.

"WE ARE VERY CONSCIOUS OF HOW EVERYONE IS TREATED."

PRI: When you were getting started, were there many naysayers—people who thought you would fail?

Stewart: For sure, at first. People said we were unsafe, and that our drivers were wild. But if you do the math, on average a track like Road Atlanta eats one car out of 100. So we'd put 300 cars on track and have a couple incidents and be under the magnifying glass. But now, GridLife TC has run almost 200 races, and we've never totaled a vehicle.

PRI: Let's talk about sponsors. Everyone wants to be part of success, so what are you looking for in an event partner?

Stewart: We think about things from a creative approach, so we think about the strategic connection: Does this partner align with what we do? Is there a story to tell? In the early days we were very much just proving the concept. I remember walking around the SEMA Show and awkwardly introducing myself to people, trying to do a five-minute pitch on this new type of motorsports event. Really it was the persistence of networking and meeting people within the industry and then bringing people to our events and into the culture and community that resulted in the

Demand for participation at GridLife is escalating to the point where events are selling out in minutes. "That's a great problem to have, but I don't want [drivers] to be disappointed," Chris Stewart said. One solution he's working on is expanding the number of Festival Tour events.

partnerships that we have today. We're getting pretty good at extracting value for our partners out of the ecosystem and the experience that is GridLife.

As an example, one of our really good partners is Valvoline. They're putting a lot of efforts and energies into influencers and content and a bunch of stuff in all different places. They use GridLife as the conduit for all those narratives to come together. What we ultimately strive for is brands who understand the vision of how we want to grow the sport, what we're trying to do, and who want to be a part of that movement.

PRI: You livestream your events online, and obviously social media is a big part of your strategy. How does that work?

Stewart: I want racing to be presented as exciting as possible, as digestible as possible, and with the highest level of creative polish possible. I think it comes down to how it's packaged. What's the most exciting part of a race? The start and the finish. So GLTC is formatted as 20-minute sprint races so that you have four starts and four finishes. That's the reason GLTC isn't multi-class; it's one class. Multi-class racing is hard to understand.

"IT REALLY COMES DOWN TO HAVING STRONG PARTNERS IN BRANDS THAT BELIEVE IN WHAT WE DO AND WHO WANT TO SUPPORT THAT VISION."

PRI: What's in the near future for GridLife?

Stewart: By the time this article comes out, this will already be public knowledge, but we just got offered the support race for the NASCAR weekend at Road America, which is incredible. I want to throw a mini festival inside of the NASCAR paddock and really bring the energy of what we do to that event. It's cool for us and cool for our drivers and the whole GridLife community. I think that's a big deal, and I want to yell about it!

PRI: What advice would you give to a promoter, a track owner, or the president of a racing club who is trying to grow their business?

Stewart: It's hard because if you were to ask me what I'm doing, I don't even know. I've talked a lot about philosophy and a high-level view, so it isn't one particular thing. Focus on this: Be the person you want to hang out with, and build the event that you want to attend. Think about the person you want to come to your event and just build something authentic. There's no silver bullet, but it's all about authenticity and accessibility. Make it as approachable as possible. PRI

SPECIAL REPORT

DEGREES OF SAFETY

FIRE IMPARTS FEAR IN THE HEARTS OF EVEN THE MOST CONFIDENT RACERS. SO, HOW WELL-PREPARED ARE TODAY'S DRIVERS, ESPECIALLY IN THE GRASSROOTS AND MID-LEVEL RANKS, TO AVOID OR MINIMIZE A SERIOUS FIRE-RELATED INJURY?

By Steve Statham

In the catalog of things that can go wrong in auto racing, getting trapped in a burning race car ranks as the most terrifying. Fire sparks an instinctive, elemental fear that drivers have to keep tucked away or else few would venture on track.

Of course, one way to mitigate that fear is to be prepared with the proper training and safety gear that makes such risks manageable. But are most drivers prepared? At the top ranks of motorsports, in the series with huge budgets and millions of viewers, fire safety training is a given. But what about at the grassroots and mid-levels? Local tracks cater to armies of low-budget hobby racers, part-timers, veteran competitors happy in their niche, and hungry young people clawing their way up the racing ladder.

Certainly, there have been huge strides in recent years in fire protection safety gear, especially in the areas of materials and automatic systems. But fire safety gear is no magic bullet. Training is essential. Knowing what to do when blinding smoke is billowing through the cockpit, the car is upside down and flames are flaring up, can literally be the difference between life, death, or long-term pain and incapacity.

We set out to analyze the state of fire safety awareness and preparedness in the sport along with what racers can do to improve their odds should the unthinkable happen.

PRACTICE MAKES PERFECT

As with everything in racing, speed is of the essence. "In term of an egress situation in fire events, every second absolutely counts," said Ben O'Connor of Impact Racing, a manufacturer of driver suits, helmets, and other safety gear in Indianapolis, Indiana. "More so in series or types of racing where first responders are not immediately present, like off-road or rally, things like that. On long road courses, the fire safety crew may be at one end of the track and you might be a mile away on the backstraight. In a fire event, every second counts. You may be knocked out for a few seconds and not even know it. And when you come out of it, you may be engulfed in flames, and then you have to figure your way out of the vehicle."

For a gut-check, real-world example of what can happen when a racing crash leads to a fire, Mark Petronis, owner of AMT Motorsport in Clifton Park, New York, went through just such an ordeal. On May 23, 2021, he was racing his 2004 Corvette in the ST2 class at a NASA Northeast race at New Jersey Motorsports Park. After a passing maneuver went awry, he left the track at 115 mph, slid in the grass, and slammed backward into a tree at 70 mph, rupturing the fuel tank and triggering a fire.


Pull
For
Fire
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TECHNIQUE
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TECHNIQUE

Following his recovery from a road race accident and fire in 2021, Mark Petronis now presents fire safety and preparedness seminars at races and events, including at the Racing Goes Safer symposium at the 2022 PRI Trade Show. His scorched helmet illustrates the importance of the helmet's visor. "I wouldn't have much of a face if my visor was up."

Petronis was unconscious and on fire for three minutes and 15 seconds before volunteers and safety workers extracted him from the car. The Corvette was equipped with a fire suppression system, but it was a manual system, which he was in no condition to operate. Fortunately, Petronis had invested in quality safety gear, including an Alpinestars suit, gloves, shoes, and underwear, and a Stilo ST5 composite helmet. The equipment far exceeded minimum safety specifications, but even so, with Petronis spending that long in a burning environment, he suffered 3rd and 4th degree burns over 35% of his body.

He was flown by medivac helicopter to a burn unit in Philadelphia and spent the next several months in the hospital, part of it in an induced coma. Many surgeries and an arduous recovery followed. Petronis filmed a documentary about his crash and recovery called "Survival" and released it in early 2022 on AMT Motorsport's YouTube channel.

When not running his business or working his way back into the driver's seat for track days, Petronis gives driver fire safety and preparedness seminars at races and events, including at the Racing Goes Safer symposium at the 2022 PRI Trade Show. One of the points he emphasizes is the importance of actually practicing fire safety drills.

"For those who have caged, competition cars racing wheel-to-wheel, pretty much any organization is going to test you either at yearly intervals or sometimes a surprise check. But for the most part, once a year you are expected to demonstrate that you can get out of a car between 10 to 15 seconds," Petronis said. "With my organization it was 10 with the door open, and 15 through the window. And before this thing happened to me, I was certainly one of those guys who did that literally once a year. Maybe I would try it once or twice before the demonstration so I could beat my other competitors in how fast I could get out of the car. In my Corvette I was able to get out in about six seconds when everything was going well.

"On the road racing level, I'll bet that most drivers aren't doing that but once or twice a year as per the requirements," he continued. "And having gone through this thing, realizing that not everything is going to go to plan the way you hope that it does, I guarantee, if guys are practicing one or two times a year going out their driver's side, no one is practicing going out the passenger side. No one is practicing while

Many race organizations, including NASA, shown here, test drivers for their ability to get out of their car in a set period of time in the event of fire.

wearing a blindfold, as if they couldn't see because the car is full of smoke. I think on the average, people are doing the minimal amount of training they need to do to get out of a car to pass the test, but I don't think the vast majority think 'what if this thing really happens?'"

Ralph C. Browning is the director of safety for Performance Open Wheel Racing inc. (POWRi), based in Belleville, Illinois, and former director of fire safety at Lake Ozark Speedway in Eldon, Missouri. He has 50 years' experience in track safety in all forms of motorsports, specializing in dirt track safety. He also has 33 years of firefighting and Specialized Rescue and Fire Instructional experience and is a trauma-certified registered nurse, and has his own track safety consulting business. He has seen the full spectrum of driver attitudes on safety issues.

"I would say it is about 40/60—40% do take it seriously and ensure they have excellent fire safety, and 60% do not. It is the 'It will not happen to me' or 'I can't afford it' mentality," he said.

"When it comes to a driver safety perspective, we highly recommend training, but it's not mandatory in the POWRi Series. In other words, we're not going to do like F1 or IndyCar or NASCAR and say, 'You have to prove to me that you can get out of your car in less than 30 seconds.' We've looked at different avenues in trying to ensure that the drivers are aware of safety and that they're aware of how to get out of their cars in the event of an accident.

"From a safety crew standpoint, we pay a lot of attention to our younger drivers because sometimes their first roll-over is life-changing for them because it scared them so bad," he continued. "And then there are those who say, 'That was really great. When is the next time I'm going to roll over?' As they grow and mature, the degree of safety that a driver puts on themselves is dependent upon what they've done in their history. You find those who have had that bad crash, and they are a little more in tune to their safety and how to get in and out of their car, versus the guy who hasn't had the bad crash yet. So those who have not had the bad crash are the ones who have that 'it's not going to happen to me,' mindset. They learn from their experiences."

RESOURCES

National Fire Protection Association Standard 610: Guide for Emergency and Safety Operations at Motorsports Venues
nfpa.org

Racing Goes Safer
racinggoessafer.org

"WHAT WORKS FOR ONE VEHICLE, ONE DRIVER, MAY BE DIFFERENT FOR SOMEBODY ELSE."

O'Connor is in the safety equipment business, but he said that there's no substitute for practicing emergency procedures until they become second nature. "I think practice is very valuable because, you never think about it, and then you're in that situation, and you could be in real trouble if you're disoriented. Building that muscle memory, practicing it over and over, is going to ensure your best chance of getting out of the vehicle in the quickest time possible."

Safety training does not have to be overly complex. The gist of it can be boiled down to a short list of priorities. "A lot of people have this misconception that if my car's on fire, I'm going to hop out and put the car out. That shouldn't at all be your concern," Petronis said. "As far as I'm concerned, the only important thing you need to do when the car is on fire is get the hell out of the car."

Petronis identified a simple order of operations. "Make sure the car is stopped," he said. "Number two, take off your belts, because you're not going anywhere unless those are off. Number three, take down your window net because you're surely not getting through the window if that's up. Number four, for me, take the steering wheel off if you're in a car that has a removable steering wheel, and you can't get out with it still attached. For me, those are the four things—stop the car, seat belts, window net, steering wheel release if you have one, and then get the hell out of there. Forget everything else that's in there."

Even with these fundamentals in mind, the order can vary from car to car and series to series. "You don't always know what the order is. What works for one vehicle, one driver, may be different for somebody else," O'Connor said. "Maybe taking the steering wheel off is the first thing you do, but maybe it's not, because of some chassis configuration change, or whatever. It may be better to remove the net first, and then restraints. That's why you have to practice."

"At POWRi, we bring everything with us to support all our traveling series," said Ralph C. Browning. "We do an assessment of the fire and rescue capability the track has on hand and then provide the necessary fire extinguishing agent and specialized tools for rescue that meet our standard."

FOLLOWING DIRECTIONS

Racers place a lot of faith in safety gear, and for the most part, that is justified. Safety equipment has come a long way. But drivers still need to be diligent in making sure they are using the gear correctly, as the manufacturer intended.

Part of Petronis' safety talk involves showing his scorched helmet. Had he not had the visor down, he would be in much worse shape today. "I wouldn't have much of a face if my visor was up," he said. "The only reason I have a face is because I had a visor that was down. I stress the importance of that as well."

Safety preparation also includes selecting parts that won't hinder safety crews. "Having a properly set up window net, having the latches done in a way that's most beneficial to egress, being able to reach the latch mechanism and easily undo it, particularly in instances when you're not right-side up, or there's a fire involved, you want to make sure that's the least bit of confusing as possible," O'Connor said.

"But also set up in a way that first responders can get to it and undo it if need be," he continued. "Most of the sanctioning bodies have rules about where the latch is located, and many of them will dictate what type of latch mechanism. A lot of that is for that reason—it's more for the first responder than the individual driver. The driver may have a set-up that works for them, but if the first responders are not aware of that setup, it can cause a lot of confusion and delay in being able to get to you. We do a lot of custom window nets, so we see a lot of latch mechanisms and things like that."

Sometimes, little details in equipment choice that were overlooked at the time of purchase, or were chosen for aesthetic reasons, can hinder the ability of rescue crews to extract a driver. "Because my belts were black, my suit was black, and my car interior was black, nobody knew where the hell my seatbelts were," Petronis said. "So I was unconscious,

I couldn't get them off, and neither could anybody else. They were reaching into the car and it was too hot and smokey, so they got a knife to cut my belts off."

SHARED RESPONSIBILITY

Driver preparation and parts selection is one side of the issue. But when it comes to fire safety, everyone involved in motorsports has a stake in improving awareness and preparedness—drivers, team owners, tracks, and sanctioning bodies. That cooperation can take many forms.

"Part of what I do when I'm traveling around and doing my speeches and seminars, is to encourage people," Petronis said. "'Look, you may be a track that has been a little bit lax on safety. What is your plan? What are you going to do to prepare? What are you going to be aware of?' The onus on safety should not only be on the driver. There should be a shared responsibility between tracks and drivers. I think if everybody took that to heart, there would probably be a lot less overall injuries, especially from fire."

For sanctions, an evolving rulebook can nudge the effort in the right direction. "Our POWRi safety rules cover the safety requirements for drivers, car construction, and seat requirements. Some rules are put in place to protect the drivers from themselves because they are focused on winning at all costs and not their own safety," Browning said.

"You take body side panels for instance. Open wheel cars, the midgets and sprint cars, you used to be able to see the driver's knees. Now, about all you can see is their eyes. So we had to write the rules a little differently to ensure that their safety is protected in limiting the size of the side panels. Because everything is about aerodynamics now, and weight, which can mean the difference between first place and third place. So we allow them to run the side panels on the right side and the left side, but they can only be 36 inches tall. They have to have 150 square inches of open space. That's so that if you come to rest on your lid, completely upside down, you can still get out the side of the car.

"THE ONUS ON SAFETY SHOULD NOT ONLY BE ON THE DRIVER. THERE SHOULD BE A SHARED RESPONSIBILITY BETWEEN TRACKS AND DRIVERS."

"The open wheel racing industry is moving toward requiring on-board fire extinguishers for sprint cars and midgets," Browning continued.

"This was missing due to a lack of suitable systems for the open wheel cars. There have been great advances in this technology. The World Racing Group has adopted the technology and is requiring it for their sprint cars beginning in 2023 and in the Xtreme Series beginning in 2024. I am confident that POWRi and USAC will follow since many of the same cars and drivers drive in all three sanctioning bodies."

This safety demonstration by the International Council of Motorsport Sciences at the 2019 PRI Trade Show displays how car construction—beyond an onboard fire suppression system—contributes to driver safety in the event of a fire. POWRi revised its rules on the amount of open space on a car's side panel to make it easier for the driver to exit.

Budgets are an issue at every level of racing, and some tracks eke out just enough profit to keep the gates open. Sanctioning bodies have a role to play here, too. "At POWRi, we bring everything with us to support all our traveling series, from the micro sprints, midgets, to the wing and non-wing 410 sprint cars. We do an assessment of the fire and rescue capability the track has on hand and then provide the necessary fire extinguishing agent and specialized tools for rescue that meet our standard. Many tracks do not have the correct fire extinguishing agent because of the fuel our cars race with due to cost. So we provide the AR-AFFF Encapsulating foam for them. One thing we want the local track safety personnel to understand is that the POWRi Fire Safety Team is not there to replace them but to enhance their capability."

There are plenty of race tracks that take the lead on issues of safety as well. "Some tracks are very progressive," Browning said, "and those are usually tracks that are owned by previous drivers. Port City Raceway outside of Tulsa, Oklahoma, is one. Shane Stewart, a former World of Outlaws sprint car driver, owns that track. He is keenly aware of safety and what it means, and they have a good program. They have their own safety team; they have a fire rescue team provided by a local fire department. At Lake Ozark Speedway, they use a combination of paramedics and paid professional firefighters."

Fire safety can be an uncomfortable subject, but racers are open to the message. On his speaking tours, Petronis said he has had hundreds of drivers tell him how his message has changed their perceptions and actions.

"I go to these track days now and I'm recognizable, for one. It's hard to miss the guy with all the burned up arms and hands and whatnot," he said. "So everybody kind of knows who I am. If they didn't before they pretty much do now. They'll come up to me and say, 'I'm wearing this firesuit because of you, I swapped out my fire system to an automatic.'

"It doesn't take many people to get into my ear to tell me I'm affecting some sort of positive change for me to feel like what I'm doing is worth it. I don't need to be touched by tens of thousands of people. If a dozen people a year tell me that they took it to heart and they're safer because of it, then I'm happy," he concluded. PRI

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"YOU HAVE TO HAVE DIFFERENT DRIVING STYLES FOR THOSE DIFFERENT TYPES OF DIRT."

LOCAL VA

By Drew Hardin

RIABLES

FROM THE RED CLAY OF GEORGIA TO OHIO'S BLACK DIRT, LATE MODEL RACERS ACROSS THE COUNTRY MUST ADAPT TO CONDITIONS THAT FLUCTUATE BY REGION OR, IN SOME CASES, WITHIN THE STATES THEMSELVES.

Bull rings and half-miles. Clay, sand, and gumbo. Crate engines and open motors. A 12-car field. A 30-car field. All these characteristics and many more make up dirt late model racing in the USA.

To the casual fan, all dirt late model racing may look the same—that's why one series boldly went topless (more on that later). But series promoters and the racers themselves know that each area of the country has its idiosyncrasies. A traveling team has to be adaptable to meet different circumstances, not just from region to region, but even from track to track in the same state.

THE NORTHEAST

"Dirt late model racing in Pennsylvania is pretty healthy overall," said Chris Zuver of the Jay's Automotive United Late Model Series (ULMS) based in Pittsburgh, Pennsylvania. "We have a lot of tracks you can go to, and we have some race tracks that are paying some really good money."

Three late model classes are the most popular in the area. "We do a super late model class, same as the Outlaws and the Lucas Oil Series—it's just more regional Saturday night racers," Zuver said. "There's also a 604 crate motor class, which is really big and has come on strong in the last 10–12 years. Down in central Pennsylvania, they have a steel-block limited late class that's a really strong class. From the open motors to the crate class, all have pretty healthy car counts, depending on what track you go to and the payout. You can have anywhere from 12 late models in a night to 30. Central Pennsylvania is really stepping up its late model program, especially Port Royal. When we go to Port Royal, it can be 40–50 cars, depending on the weekend."

Track surfaces vary according to where the track is in the state, Zuver said. "Up in northern Pennsylvania most of our tracks are pretty dry and slick. We don't have too many cushions. Then we'll go to a couple central Pennsylvania tracks—basically they're sprint car tracks—where the cushion is 12–18 inches high. Central Pennsylvania is all red clay, while the northern Pennsylvania area is more or less a sandy, gray clay mixture that doesn't lay much rubber down like the red clay race tracks do."

"Dirt late model racing in Pennsylvania overall is pretty healthy," said Chris Zuver of the ULMS. "We have a lot of tracks, and we have some tracks that are paying some really good money. I think our region pays better than a lot of places do in the country." Photo courtesy of Gary Shrey.

Zuver believes "we've had some of the toughest racers around come out of our region, not just recently but over the last two or three decades. We've had Hall of Fame racers come out of our area, like Chub Frank, Gary Stuhler, Lynn Geisler, and Rick Eckert. They raced in central and western Pennsylvania. They grew up there, they cut their teeth there, and they became professional racers from there.

"I have two drivers on the World of Outlaws tour that are past ULMS champions, so our region is a really strong region when the national series come into Pennsylvania," Zuver continued. "They know they have to face some tough competition. The weekly regional racer can win a national event at their home race track. They have proven it time and time again. I am proud to be part of that region."

THE MIDWEST

"The first thing you think of when thinking of late model racing in different regions of the country is the dirt," said Bobby Pierce, currently on the World of Outlaws tour; his Bobby Pierce Racing is headquartered in Oakwood, Illinois. "Once you get to the Ohio/Pennsylvania area, we always just call it Ohio dirt—it's loose brown. When you get to Illinois, Iowa, and Minnesota, most of the time it's pretty black, almost completely black. You can feel it racing on different types of dirt, how it will make the car handle, your entrance to the corner, just everything as far as the driver's feel of the dirt right underneath them. You have to have different driving styles for those different types of dirt."

"Midwest dirt is completely different," agreed Kelley Carlton. Based in Woodruff, South Carolina, Carlton is race director for the Ultimate Super Late Model Series and works with the FloRacing Night in America series. "It's more of a black dirt, very rich in nutrients, which is why agriculture is so good in the Midwest. It races really well, holds moisture really well, compacts really well. It's not as sandy, not as abrasive, doesn't take rubber quite like our places in the South do."

In the Midwest, "you have to be prepared for anything," Carlton said. "You can have three-wide racing, it can be super sloppy wet, or a place like Fairbury [Speedway in Illinois] can stay pretty tacky throughout the night but will slick up in places, too."

"You can kind of narrow it down to the states," Pierce added. "In Tennessee, you know nine times out of 10 you're going to be racing on a very banked race track. If you're racing somewhere in Illinois, you know it's probably going to be a little quarter-mile bullring. If you're racing in Iowa, they're really known for their big half-mile flat tracks."

Hall of Fame driver Ronnie Johnson, the Chattanooga Flash, said that when he raced in the Midwest, the tracks would "typically start out with a lot of traction in them early on. A lot of those tracks that we would go to in Indiana and Illinois were pretty small, so you had all these cars on this one little piece of real estate.

"The track really changed throughout the night and really goes away," Johnson said. "By the end of the night, we'd wind up racing clear in the infield, like in the grass. You'd find more traction in the grass than you could on the race track because it'd get so slick. When we used to go to Brownstown [Indiana], I'd see guys make time actually driving the right-side wheels off the race track going down the straightaways because there was still traction out there, even though it looked like they were off the track."

Track conditions dictate the tune, as well. For a track like Fairbury "that stays pretty wet all the time, you want as much horsepower as you can get to the ground," Carlton said. "Or if you go to a place like Knoxville for the Late Model Nationals, you're on the wood constantly. You need all you can get and then some until it starts to slick off at the end of the night."

Pierce said the different areas of the Midwest support different dirt late model classes. "If you head to somewhere in Illinois, you'll have super late models, then two or three different classes of modified. Farther out into Iowa, you'll start to get into the IMCA region, so there'll be IMCA cars. Or if you go into Texas, or maybe like Oklahoma, you'll be racing with USMTS modifieds. It's cool to see the different scenery that you get from most places."

Car counts, Pierce said, "kind of vary. A good car count starts if a track has a good local following of cars. You can go somewhere that has a great car count, then

Bobby Pierce, currently racing on the World of Outlaws tour, said dirt late model drivers get a feel for the different kinds of track surfaces they race on, "how it will make the car handle, your entrance to the corner, just everything as far as the driver's feel of the dirt right underneath them."

When racers remove their roofs to run with the Topless Outlaws, "it lets the air hit the spoiler a little different," said Michael Robinette. "The drivers utilize the spoilers a little more with us, because they have a lot less turbulence when air reaches the spoiler. But there's not a big difference in lap times. The drivers say they don't change anything about their cars to race topless."

you can go somewhere the next day that's only 30 minutes away, and they don't have a good car count at all. It always seems like when we go somewhere to race, if it's a track that doesn't have late model racing on a local weekly basis and doesn't have a local following, then when you go there it's mostly your guys running the series."

THE SOUTH & SOUTHEAST

"The most glaring difference" between the rest of the country and the South, Carlton said, "is that the formats are different. Compared to the Northeast or the Midwest, the South is its own world. Our formats have a little less racing because of the track surfaces and the numbers of classes."

In other parts of the country, the dirt late models "will qualify, then go to a heat race, and then transfer a certain number of cars from the heat race. Everyone else will go to a B Main or Last Chance race, which will also transfer another amount of cars to the A Main." By contrast, in a Southern Super Late Model series, "they'll take a certain number of cars from qualifying directly to the A Main, and all other cars to a series of B Mains or heat races. That will be the last thing before the A Main."

The tracks in the South, "particularly in the Southeast, are a little more sandy, a little harder on tires," Carlton explained. "So fewer laps lead to better racing. The surfaces don't hold up as long, with the heat index and humidity. So the longer you go, the later in the night and the more racing you put onto the track, the less competitive the track becomes. Everybody wants to have the best racing during the A Main when it pays money, so that's an adaptation that's happened here in the South.

"That has nothing to do with the preparation that these track guys are doing," Carlton added. "They're working their guts out trying to do track prep, but the surface just doesn't hold moisture as well, doesn't stay as racy through the night as it does in some places in the Midwest where the water table and the temperatures are completely different. We have such hot summers in the South, and horribly high humidities, which you'd think would help with that. But it's actually the reverse. The humidity draws moisture out of the surface."

After the local climate, "the make-up of the surface, what the dirt is made of, is critically important," Carlton said. "We have places here in the South, like Senoia Raceway [in Senoia, Georgia], which has a gray clay mixture that they call gray gumbo. It doesn't require a lot of moisture to be racy. It's super slick top to bottom. That's my favorite kind of racing, when the track slows way, way down and you can race all over it because it's so slick. Nobody really has an advantage for traction, so you kind of have to race all over it to find where your car handles the best."

"Because I've raced for a long time, most of the tracks that I'm going to I have experience at," said Johnson, still actively racing at age 67. "So going in, if there's a Topless Outlaw race at Wartburg, we know that track has a certain type of dirt on it, with a little bit of gravel in it. So it's going to call for a more aggressive chassis setup, a more aggressive driving style than, say, the Talladega short track. That track is much smaller, so when you go in there you drive with more finesse. You have more traction in the car."

Johnson said he "really enjoys" running at his local race track near Chattanooga, Tennessee, which is Boyd Speedway in Ringgold. "Those guys work really hard. When racing gets stagnant, they will go out and re-clay the track, shake it up. Those

Car counts vary depending on where you are in the country, said Kelley Carlton. "We're lucky to get a full field of 20–24 cars or close to a full field in the South. When we go to Eldora [in Ohio, seen here], we'll be in the 60-car range."

guys out there do a lot to put on a good show and get it done in a timely manner."

Michael Robinette started the Topless Outlaws Dirt Late Model Series of Tennessee about five years ago as a way to have a class that looked different than the other dirt late models. "When you go to a dirt track now, anywhere you go in the US, they have three to four late model classes—crate, sportsman, supers, limiteds—and they all look like the same cars that just pulled off the

"THE FIRST THING YOU THINK OF WHEN THINKING OF LATE MODEL RACING IN DIFFERENT REGIONS OF THE COUNTRY IS THE DIRT."

track. When we roll onto the race track, the wives and everybody in the grandstands can recognize the difference because we don't have roofs. We adopted it as our identity. When we're on the race track, everybody knows that's us."

Robinette could describe the surface characteristics of every track his series' roofless cars race on, including Tazewell Speedway in Tazewell, Tennessee, which "has been a hooked-up race track that has stayed incredibly smooth. One of our drivers, Austin Neely, set a limited track record at Tazewell at the first race last year—an 11:29 on a one-third mile dirt track. That track never rippled up, stayed really fast, and produced good racing. Then you go right down the road to 411 [Motor Speedway in Seymour, Tennessee], and that thing will get black. They call it black ice. They'll race three-wide around it. From the bottom to the top it'll be black and just race great.

"Senoia has some kind of dirt on it that's actually a byproduct of a mining company in Macon, Georgia. They call it black gumbo," Robinette continued. "That thing is smooth, slick as glass. You can't use any horsepower. It's a big, nice race track, wide as it can be, but it's one of [those] where

The High Plains Late Model Series was started in 2016 "to salvage late model racing in the Rocky Mountain region," said Jerry Hanson. Since those early years, car counts and the number of events have climbed steadily, and the series races in a half-dozen states around its Colorado base.

a crate motor is liable to win a super race because you just can't use horsepower on it. It puts it back in the driver's hands."

"The engine that you choose makes a big difference," said Carlton. "The slicker the race track is, the less horsepower you want. A guy like Michael Page can run a 525 crate engine at Talladega and Senoia and be just dominant because the race track was so slick. You could not get power to the ground. He had a perfect storm—just enough power that he needed, but he kept from spinning his tires."

Car counts are "all over the board" in the South, Carlton said, due in part to a certain amount of regional fragmentation. "Guys who race around Senoia, east Alabama, the Dixie region, they kind of just stay in that area. We have a group of cars in the Carolinas, and Florida does its own thing."

Car counts in the Midwest, "like at Fairbury in Illinois, they'll have 30 dirt late models at a regular Saturday night show," Carlton pointed out. "In the Southeast, 30 late models is a dream. We're lucky to get a full field of 20–24 cars, or close to a full field. When we go to Eldora [Speedway in Rossburg, Ohio], we'll be in that 60-car range, Brownstown [Speedway in Brownstown, Indiana] the same, but it fluctuates all over the board. When we go to West Virginia, who knows? It could be 28, or we could be 48. It depends on a lot of factors. Like the weather. Everybody's being smart now, with the economy like it is. If the weather doesn't look good, they're probably going to stay home and save the fuel, or stay closer to home to race."

For the Topless Outlaws, "car counts have been really healthy, averaging around 29," observed Robinette. "We had two races with 40 cars, which helped our average, but throughout the year our races had 28–29 cars."

THE HIGH PLAINS

Jerry Hanson started the High Plains Late Model Series in 2016 "to salvage late model racing in the Rocky Mountain region," he explained. Based in Arvada, Colorado, the series started with six races its first year, with car counts averaging eight and topping out at 15. Last year Hanson put on more than 20 races, "and at our Dave Garmann Memorial race we had 30 cars, the most we've had in 25–30 years out in this area."

How does he explain the growth? "Being supportive of the racer is the biggest difference you're going to find in our region from some others. We don't have five tracks within an hour or a couple of hours of each other. There may be a five- to six-hour drive between tracks." So Hanson fosters an atmosphere of fun and camaraderie among his participants. "If you talk to the racers, it's like a big family. It doesn't matter where you come from, if a racer goes down, everybody's pitching in to try and get him back out on the track." Hanson puts on multiple cookouts for the racers during a season "as a way to say thank you for your devotion." And if he finds he has extra money, "I just put it out there. In a couple of different cases, we had a track that was way overwatered, and I gave everybody an extra $30 to spend extra time rolling in the track and getting it race ready."

The High Plains classes "mirror Malvern Bank, but not as detailed," Hanson explained. "We are a run whatever you have, but you'll have to run a restrictor plate, and that depends on cubic inches. I have everything from a LS7 to a 604 crate to a Pro Power 430 running with us. We have guys that run IMCA spec motors, WISSOTA spec motors, and CP525s. It's an inclusive engine package on restrictor plates."

Due to the region's dry climate and elevation, "our tracks will predominantly go dry slick and take rubber, depending on the weather," Hanson said. "Our clay here is more a sandy abrasive clay than back East."

Even with his growing car counts, Hanson realizes "there are still a lot of cars here that

aren't being raced. In the Denver metro area, I would speculate there are 30 cars. Some of them are race ready, some wouldn't take too much to get them race ready." He is working to recruit them, "but out here there's so much more to do, with the lakes, mountains, camping with family. There are other things to do than just racing."

"Competition for the dollar is something we battle," Carlton said, no matter what the region. "We did a promoter's roundtable recently where we realized race tracks are not competing with each other as much as they are competing with outside interests—bowling, baseball, football.

"One of the things we talked about at that roundtable is we need to improve the fan experience," Carlton said. "Work toward having more satisfaction, shorter programs that finish at a decent hour, higher quality concession foods, creature comforts, better seating, good bathrooms. There's just competition at every corner we turn."

Zuver agreed with Carlton, adding the "biggest thing" he learned as a former track owner is "you do not race on opening day of NFL football." PRI

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OP SEA

HOW TODAY'S RACE SERIES, ENGINE BUILDERS, AND DRIVERS ARE WORKING WITHIN RULE SETS TO ENSURE THE CONTINUED GROWTH OF DIRT LATE MODEL RACING.

By Drew Hardin

Photo courtesy of Dirt Kings Late Model Tour

EN SON

Bill Schlieper's engine building company, Pro Power Racing of Sullivan, Wisconsin, is a prolific supplier of engines for all kinds of racers, including a number of dirt late model clients. Over the years, he has seen racing series and sanctioning bodies write, re-write, borrow, and adapt engine rules in attempts to save competitors money, achieve parity on the track, do a better job of filling Saturday night events, or some combination of all three. In many cases, he believes, those attempts have backfired and done just the opposite.

"I've watched it happen over the years, where racers picked their favorite engine," he explained. "Whether they helped design it or were a part of it, they were excited to have it. Then all of a sudden, a series or sanctioning body would decide, 'Hey, we have a better idea, and we're going to save you money.' Well, they took what you had picked and made it worthless, made it something you couldn't use. It was very frustrating for a lot of teams. A lot of sanctioning bodies made whole complete teams quit. Guys were sick of the rules changes and sick of having assets that they loved that became worthless."

Schlieper also sees danger in engine rules that are too complex. "When there's a large rulebook and a lot of rules, there's more cheating. When rules are very strict and very specific, where you

On the Dirt Kings Late Model Tour, "we give competitors the option of running an open motor with a restriction, or a limited-cubic-inch engine with a steel block," said Jason Shultz. "Our races are split almost right down the middle between open motors and WISSOTA motors winning."

have to measure within thousandths and cc's and cubic inches, often they just let it go, they don't even check it. But when the rules are simple, everybody can understand them, and they're easy to follow and they're easy to tech, tech guys tend to tech them."

Mark Campbell of the Edelbrock Group in Olive Branch, Mississippi, agreed. "If you don't have qualified personnel or enough personnel to properly tech engines, absolutely it can get carried away. I'm a racer myself, and I was previously an engine builder for 20 years, so I know exactly what Bill's talking about.

"Even in these crate motor classes, where they're supposed to be sealed engines, these guys are crafty," Campbell continued. "It's the engine builder's job to make as much power as they can, and, of course, find the gray areas in the rules. But if you don't have an educated or a big enough group of people to properly inspect those engines and tech them, things can get out of control very quickly."

"The bigger you write a rulebook, the more loopholes you write into it, and that's exactly what it is with crate motors," said Jason Shultz of the Dirt Kings Late Model Tour, Freedom, Wisconsin. "They say you have to run this valve spring; now somebody's going to make a valve spring that looks identical but it's a different material, so the tensile strength of the spring has a different rate. That makes a big difference. Or they're going to find a way to change the camshaft or regrind the cam and do what they need to do to change the entire performance of the engine. Really, the only way you're going to find it is completely tear down a crate motor. I have huge issues with the idea of tearing down a crate motor, when the cost of the tear-down will outweigh the winnings the driver might take home."

Engine rules have been "a hot topic for many years now," Campbell said. "We see a lot of challenges out there, with all the different classes and different rules. Things start to divide. We only have so many racers. If you make too many rules in too many classes, you wind up paring down a lot of the classes to where they're a lot smaller. Or some of them just end up dying off because they simply don't have any car count. If you leave the rules too open, then it becomes a money game, and then you segregate a lot of the classes based on just dollars. It becomes a rich man's sport.

"We want to keep racing strong and going hard, but when you start making too many rules or making it too challenging for the people to do it, it becomes a big problem," he said. "I don't envy the rule makers. It's very challenging and very tricky to find a happy spot in the middle."

THE OPEN MOTOR SOLUTION

What Schlieper advocates to address these various problems is simplifying engine rules. Allow dirt late model racers to run open engines while allowing the race series to set power limits on those engines by using restrictor plates.

"In the WISSOTA series there's a spec limit of 700 horsepower, and when the track's slick or it's a small track, you actually have a competitive car against an open car straight-up," Schlieper pointed out. "But what WISSOTA did was put a restrictor on the

Allowing open motors—with restrictors as needed—gives drivers flexibility in terms of where they race. "A racer like Bobby Pierce can unload his car that's legal anywhere in the country, put on a carburetor restrictor that he already has in the trailer because they run it when the track dries out, and he's Dirt Kings Tour legal, no questions asked," Jason Shultz said.

Bill Schlieper provided this photo of the kinds of engines Pro Power Racing brings for track support (left to right): a 450 D3 Ford, Chevy 10-degree wide-bore 440 package, Chevy 11-degree 454 wide-bore, and a 436 Ford RY45 package.

open motor to match the 700 horsepower. That made it so local engines could race against travelers when they came to town. More and more guys saw that they could run an open engine, and be competitive at the local race track, because they ran the same rules.

"The rules are a $30 restrictor. They can change your engine package for $30," Schlieper added. "Now you don't have to start over or throw your engine away."

Plus, "you never hear that somebody got cheated with an open engine," Schlieper said. "It doesn't even exist. That's why I've always been a proponent of open engines. Guys like my little brother [Dan Schlieper] started with used open engines, and he won the World 100 with a used engine. If you can win at the highest level with a used engine, that's probably the best rule you can have. Because most guys have more power than they need. It just helps the guys who are getting new ones to sell the old ones because the old ones are just as competitive."

"YOU SURELY DON'T WANT TO HAVE THE MOST EXPENSIVE CAR, THE MOST EXPENSIVE CHASSIS SETUP, OR THE MOST EXPENSIVE SHOCKS WITH THE CHEAPEST ENGINE PACKAGE."

Allowing open motors—with restrictors as needed—gives drivers more flexibility in terms of where and in which series they race.

"A racer like Bobby Pierce can unload his car that's legal anywhere in the country, put on a carburetor restrictor that he already

has in the trailer because they run it when the track dries out, and he's now Dirt Kings Tour legal, no questions asked," Shultz explained.

Pro Power open motor customer Taylor Scheffler "has the opportunity to race against WISSOTA motors and against the Dirt Kings, but he can still race across the border in Illinois when Farmer City comes for $25,000 to win," Schlieper added.

Racer Andrew Kosiski, whose father Joe started the Super Late Model Racing (SLMR) series, has open and spec-headed engines for his dirt late model. "I have two spec-headed motors. I like the way they drive, but when there's an open motor race coming up, those ain't gonna keep up. Then I have to put this open motor that Bill Schlieper just got done with, put it in the car and race it. I'll race it with three or four of our Malvern Bank races because it happened to be what's in the car. Throw a restrictor plate on it, run it with the SLMR, take the restrictor plates out, and race it wide open."

Schlieper also contends that an open motor makes the drivers better and makes for better racing. "When you have more power than you need, you end up with guys who have to use their foot. They become throttle jockeys, guys who can control every part of the race car. It becomes very much of a driver's race, instead of a horsepower race, or just the guy who had the most money race. Many of these drivers who work on their talent and use their foot become better and better, and that's really what pays off in the long run, whether they stay in dirt late models or move on to NASCAR. They also can be competitive with the open motors when a Lucas Oil or a World of Outlaws race shows up. Now they're racing for $10,000 to win versus $1,000 to win at a local show and another $1,000 to start, versus $200–$300 to start. So a lot of racers are getting more excitement in their team and into their sponsors, and it's started to become infectious. It's made for more cars and better car counts."

Andrew Kosiski (#53) said he likes the way his two spec-headed motors drive, "but when there's an open motor race coming up, those ain't gonna keep up." He'll then install one of Bill Schlieper's open motors, race it, then "throw a restrictor plate on it and run it with the SLMR."

Engine builders, too, appreciate the freedom of working on an open motor. "A more open set of rules is better for us," Campbell said, "because it lets us be a little more creative, lets us do what we do best at Edelbrock and COMP Cams—design and develop really good parts to make as much power as we possibly can."

"A DIRT LATE MODEL IN ITS PUREST FORM IS SUCH AN EXOTIC MACHINE."

"It allows us to use what we have," Schlieper said. "Say we have a used spec motor for WISSOTA. We can sell that to a customer, or we can sell them an open motor, and there can be a $10,000 difference between a used WISSOTA motor versus a used open motor, and the guy has a legitimate shot at winning once he gets one of our used packages, much less getting one of our new packages.

"A dirt late model in its purest form is such an exotic machine," he said. "You surely don't want to have the most expensive car, the most expensive chassis setup, or the most expensive shocks with the cheapest engine package. A lot of the drivers aren't looking for that. They're looking for speed. They want to go fast."

VARIATIONS ON THE OPEN MOTOR

"On the Dirt Kings Tour, we give competitors the option of running an open motor with a restriction, or a limited-cubic-inch engine with a steel block," Shultz explained. "It's something like the WISSOTA-style motor, but then we open up some of the rules that WISSOTA puts on. We don't make them run an rpm chip. WISSOTA makes the cars put weight up in front of the motor, but we let them take all that stuff off to try to make it as competitive or as equal to the open motor as we can. With the open motor we make them run either an inch-and-a-quarter restrictor plate or 50 pounds in front of the motor plate."

The Dirt Kings Tour "runs a lot of races near WISSOTA race tracks," Shultz continued. "They can unload just the way they are, and their car's legal and competitive. We've found a nice balance. Our races are split almost right down the middle between open motors and WISSOTA motors winning, and it's really just a matter of preference and cost."

On the subject of cost, Shultz said what a lot of his drivers do is "find what used to be a restricted or WISSOTA motor, one where the block's already had two freshens. Now they can punch the block out, make it bigger. It's no longer going to meet that WISSOTA rule, it's now an open motor, but they can keep some life in the motor.

"We're not seeing most of our competitors going out and buying $45,000–$50,000 motors, even though we allow it," Shultz continued. "They're keeping it to a reasonable cost, and they're getting more life out of their engine that no longer meets the rules because it's been freshened or done. I've got a really smart group of racers who know that when my shows average $2,500 to win, and my biggest purse is $5,000 to win, and three-quarters of them have day jobs, it doesn't pay to spend 50 grand on a motor."

The Dirt Kings Tour is "getting ready for our seventh year," Shultz said, "and we've averaged over 23 cars every year every race. Most years have double-digit car counts of 100% participation, which again is better than most regional tours. We race side-by-side and fast, and because we do, the fans aren't going to know the difference between a 15-second lap and a 16-second lap. All they care about is that they're seeing a good race.

"And it's loud. I guarantee we're still very loud," he added.

For the Malvern Bank Series and Hoker Trucking Series that make up SLMR's racing, Joe Kosiski developed a set of engine packages so "you can run anything in our series," Andrew Kosiski said, "where you can't really do that everywhere. There's absolutely no reason why, if you have a dirt late model with a motor in your shop, you can't come race with us."

It has taken years, and "many, many hours on Speedway Motors' dyno" for the Kosiskis to design these packages, which now produce around 650 hp, no matter the engine. "He's really got it to where three or four of the motor options are wide open, and then the other ones have to be restricted" by running prescribed cup sizes in the restrictor plate, Kosiski said. "But he's keeping it so close, and we've gotten it so I can damn near tell you what one or two cups do for horsepower and torque. We've tried to make it as user-friendly as we could, so a guy could go race for $30,000 to win in Wheatland, Missouri, and on his way home stop at one of our races, put some cups in his motor, and race with us."

In 2022, "we had six different motor options win in our series, so that tells you they all can win at any given weekend in any given race," Kosiski said.

We had no trouble finding engine builders to list the benefits of open engines in dirt late model racing. "If you have an engine that can be built and rebuilt by any and all engine builders," said one, "it allows for racers to make decisions according to what they feel is the right thing for them. That's what it's all about."

It was from Kosiski that we heard the term tweener motor. "There are a lot of motors out there that people haven't used. 'Where am I going to take this motor and race? It's not good enough to race with these guys, and it's too good so it's not legal to race with these other guys.' We call it a tweener motor. 'What am I supposed to do with this tweener motor?' Well, guess what? Here's a series that'll let you run that tweener motor.

"Let's say it has 1,000 laps on it and needs to be freshened. Call Bill Schlieper, call one of the other motor builders, and say, 'I got this motor, can you freshen it? I want to run the SLMR series.' At that point the engine builder says, 'Hey, I know motors in that series. We can put some different heads on that motor if you want, and it would be even better.' It really has opened up more opportunities for the racers and the engine builders," Kosiski added.

NATIONAL CHAMPIONSHIP

As it turns out, Bill Schlieper has an agenda that's bigger than just getting more racers to use open engines.

"I've always been a proponent of PRI being positive toward the whole industry and engines built by any and all engine builders because that's what you have for a market to sell," he said. "You have all these competitors in pistons, all these competitors in rods, all these competitors in crankshafts, or cylinder heads, or blocks, or all the other parts that go in engines. You're basically limiting them with crate motors coming in and becoming part of the series. So if we could work together and build point funds and national championship point funds for open engines, where any and all engine builders can participate, that allows all those parts manufacturers that are on the PRI Show floor to be a part of it. That's what we gotta push for." PRI

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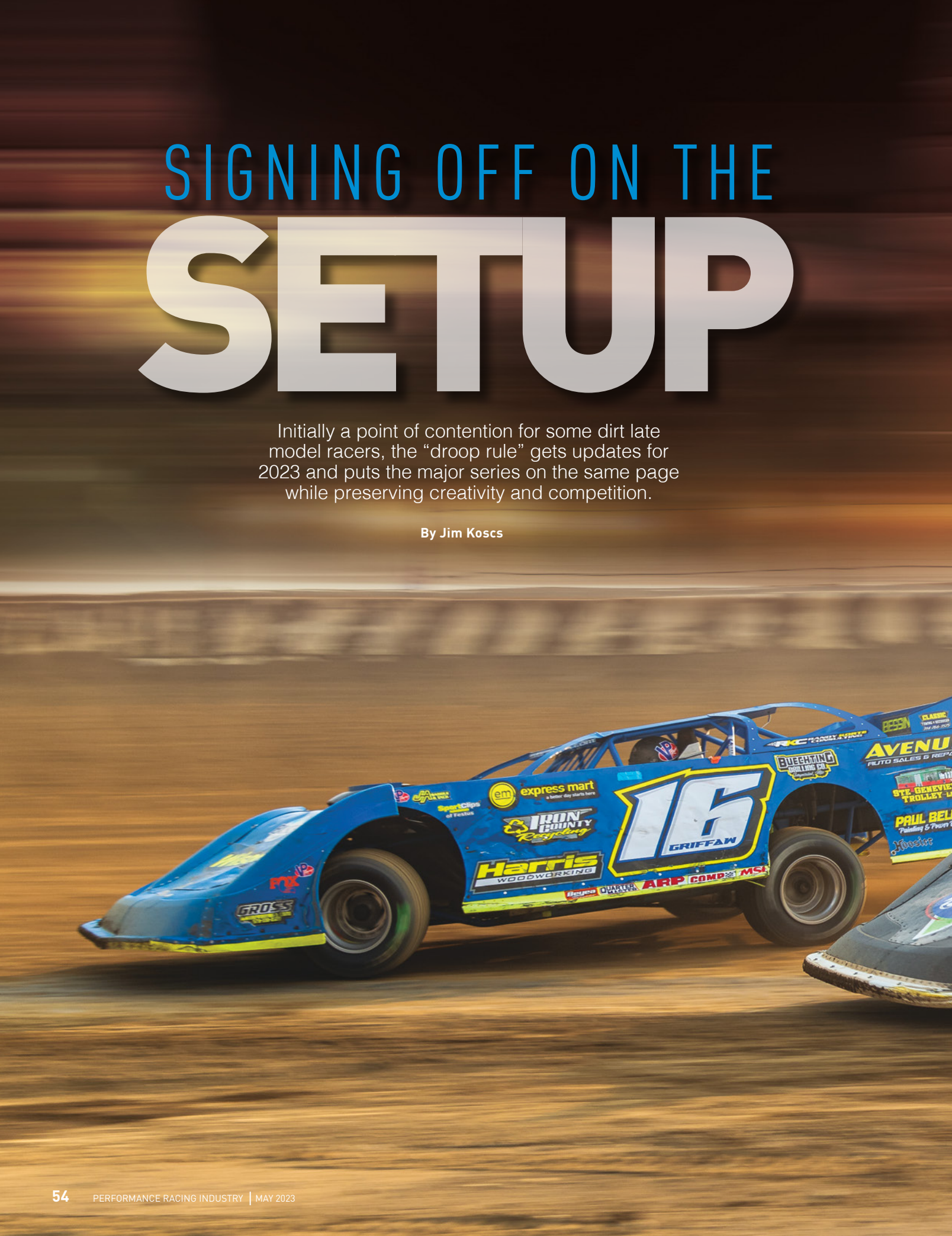
SIGNING OFF ON THE SETUP

Initially a point of contention for some dirt late model racers, the “droop rule” gets updates for 2023 and puts the major series on the same page while preserving creativity and competition.

By Jim Koscs



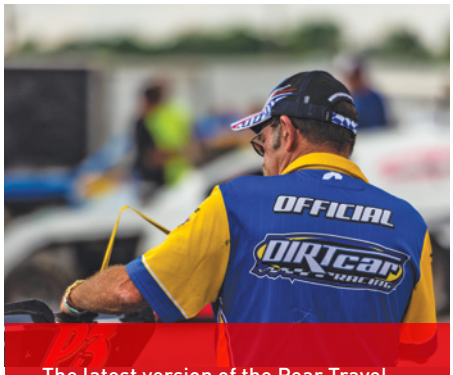
Across the vast motorsports spectrum, builders and racers have historically grappled with rules changes designed to help even out competition or improve safety, or sometimes to correct problems caused by previous rules changes. It's all part of the racing landscape. And almost universally, racers can be resistant to change, often due to confusion over a new rule or the cost to meet it. The "droop rule" in dirt late model (DLM) racing was no exception.

Cutting to the most important point, the droop rule remains part of the 2023 Unified Dirt Late Model Construction Rules meant to get all DLM series on the same page. The rule had been a part of the 2022 Unified Rules, but in September 2022, it looked like one tour, the XR Super Series, was going to drop it. In fact, that did occur, but only for two races: Kokomo and Las Vegas.

A significant change to the 2023 droop rule implementation brought XR back to using it, according to event director Bucky Doren. We'll explain in a moment.

First, those not versed in the often deceptively complex workings of dirt late model chassis construction and aerodynamics might well wonder why the bodies tilt (or "droop") rightward and move the chassis geometry sideways when the cars enter the track. It's a design feature that pushes the left rear deck spoiler higher into the air to generate added downforce. Prior to the rule, cars were pushing their left rear corners 58 inches into the air. The post-race inspection called for 39-inch rear deck height as measured at the center, and drivers were known to stand on the cars to compress the suspension long enough to pass through.

How much benefit the high left deck height provided depended on where a driver was in the pack. A car following the leader closely might lose downforce, because



The latest version of the Rear Travel Limiter Rule—a.k.a. the droop rule—specifies post-race left rear deck height not higher than 51 inches. Violations used to result in disqualification, but that has since been amended and is now a position penalty.

"THE BIGGEST REASONS WE AGREED TO GO BACK TO THE DROOP RULE WERE THAT THE RIGHT REAR WHEEL WAS NO LONGER A FACTOR, AND IT WOULD NOT ENCOURAGE RACERS TO BUILD TWO CARS."

the front car was blocking the air. Some believed, as well, that the setup could turn a minor bump from a competitor into a major rollover mid-apex.

DID LIMITING DROOP DAMPEN COMPETITION?

By most accounts, the "droop rule" first appeared in the Southern Nationals races promoted by Ray Cook at the start of the 2018 season to limit vertical travel of the left rear suspension. The rule required DLM cars to have a chain connecting a collar or bearing-type mount on the left rear axle tube to a mount on the left rear frame directly above it.

Because the droop rule was not universal across series, some racers built different cars for each, an expensive proposition not all could afford. The 2022 Unified DLM Construction Rules were meant to address that concern.

Steve Francis, current director for the World of Outlaws Late Model Series, affirmed his support for the rule but admitted he was not initially a fan of it. Francis had retired from a stellar 35-year racing career in 2017 after achieving nearly 300 victories, then at first became technical director for the Lucas Oil Late Model Dirt Series. He told PRI that he does not believe increased rollover potential was the biggest driver in adopting the droop rule.

"The whole idea was to get the rear spoiler out of the air some," he said. "We'd gotten to the point where the guy that could figure out how to get his car the highest in the air would win the race. Naturally, with a car 58 inches in the air versus 51 or 50 inches, there is a difference in how easy it is to roll that car over, but I'd say the biggest thing is allowing the car behind it to be able to get air on it."

The World of Outlaws Late Model Series' Steve Francis sees adoption of the droop rule as beneficial to dirt late model racers. "It has allowed racers to get out of the very complicated stacks in the springs and things like that. Now, there's a lot of conventional single springs being raced." Photo courtesy of Jacy Norgaard and World of Outlaws.

In response to numerous racer arguments and complaints over the droop rule, Francis initiated dialogue with other series in late 2021. At the PRI Trade Show that December, Francis, Kenny Kenneda from World of Outlaws, and officials from other series hammered out what became the 2022 Unified Dirt Late Model Construction Rules. Among these was the Rear Travel Limiter Rule, a.k.a. "droop rule."

That version of the rule specified post-race left rear deck height not higher than 51 inches, checked with both tires just off the ground to let a .040-inch shim slip beneath them. Violation called for a disqualification. Those two elements would become sticking points for Doren at XR Super Series, leading to his fall 2022 attempt to drop the rule.

OVERCOMING OBSTACLES

"The biggest issue that we had behind the scenes in 2022 was that the right rear wheel had to be off the ground at inspection," Doren told PRI. "We started the season with it, but by mid-season, we felt we would try dropping it to gauge driver reaction, and to evaluate the competition."

For the two races where XR dropped the rule, Doren said it appeared to help the competition somewhat. "Driver feedback was mixed," he said, "but most said to keep it so that they didn't have to build two cars. So, the biggest reasons we agreed to go back to the droop rule were that the right rear wheel was no longer a factor, and it would not encourage racers to build two cars."

Doren was also concerned that the droop rule, as implemented last year, could have limited racers' ingenuity and dampened fan enthusiasm. "We want to make sure that these teams can still be creative with their setups," he said. "They're still finding ways to get around it, regardless, but that

mystery is also part of the fun for the fans. If somebody goes too far, it's an infraction, but now it's a position penalty, not a DQ as in 2022."

WORKING FOR RACERS

Francis sees wide adoption of the droop rule as beneficial to dirt late model racers, starting with reducing chassis complexity. "There are still arguments over the droop rule, but it's maybe a third of what it used to be," he said. "Before, you'd have to have an engineer trying to figure out how to get the car higher in the air. As you pull them all back down, it's less technical. It has allowed racers to get out of the very complicated stacks in the springs and things like that. Now, there's a lot of conventional single springs being raced."

Francis told PRI he believes the droop rule still allows room for creativity and exciting competition. "I feel like the current version of the rule and the current tire rules, where race teams have choices, have made dirt late model racing much better," he said. He cited "really good racing" at the start of the season, with plenty of passing and lead changes.

"We had a guy at Volusia who started around 23rd and won in a 50-lap race," Francis said. "I think that speaks well for the sport right now and where the rules packages are." PRI

The whole idea behind the droop rule "was to get the rear spoiler out of the air some," reported a dirt late model source. "We'd gotten to the point where the guy that could figure out how to get his car the highest in the air would win the race."

SOURCES

World of Outlaws Late Model Series
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xrsuperseries.com


LUCAS OIL
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BUSINESS PROFILE

SCOTT BAILEY RACING ENGINES

PERSONALIZED ATTENTION TO CUSTOMERS COMBINED WITH TIRELESS R&D WORK HAVE WON THIS MIDWEST-BASED SHOP MULTIPLE ENGINE BUILDER OF THE YEAR CROWNS, AND THE LOYALTY OF DIRT LATE MODEL COMPETITORS THAT ARE TYPICALLY TREATED "LIKE FAMILY."

By Andy Heintzelman

Scott Bailey and Josh Poe consider the customers of Scott Bailey Racing Engines (SBRE) family.

And dealing with family sometimes requires tough love.

Since the start of the COVID-19 pandemic, and continuing through the present day, Bailey and Poe are clear with their dirt late model customers that the time it takes to get a new or refreshed engine has changed because of ongoing struggles with parts availability.

"I feel like the best thing we can do to provide service to our customers is explain to them the timeframe it is going to take to get them the engine they need," which is now a year in advance, not month to month, Poe said.

Though it's been a period of "extreme" stress, Bailey said, no SBRE customers have gone without getting the engine they wanted, proof that the company's small size works as a benefit.

"I think it's really important to say we're not the biggest; we're a very small company," Bailey said. "But we give our customers very close attention."

Bailey started Scott Bailey Racing Engines about 15 years ago and worked by himself until Poe came on as co-owner about seven years ago. They're a two-man show today: Bailey spends most of his time in sales, R&D, and helping customers at the track, while Poe

Tad Pospisil, at left, celebrates with SBRE's Scott Bailey, right, at the Knoxville Nationals. Time at the track is "one of the most valuable aspects of what we do," said SBRE co-owner Josh Poe. "I truly feel like that's why a lot of our customers are here, because they know that Scott's going to be at a majority of the races they're at."

builds a majority of the 40 new and refreshed engines they produce per year from their 1,500-square-foot shop in Peculiar, Missouri.

SIMILAR BACKGROUNDS

Scott Bailey Racing Engines has victories and track championships too numerous to count, but its eight regional touring championships in series that include Midwest Late Model Racing Association (MLRA) and Malvern Bank Super Late Model Racing (SLMR) stand out, according to the co-owners.

Ninety-five percent of their work is in the dirt late model market, though they also service a few modified customers.

Bailey said he and Poe came from similar backgrounds, and both had fathers who were accomplished mechanics and body men. "We grew up helping our dads back in the 1970s and 1980s just handing them tools," Bailey said.

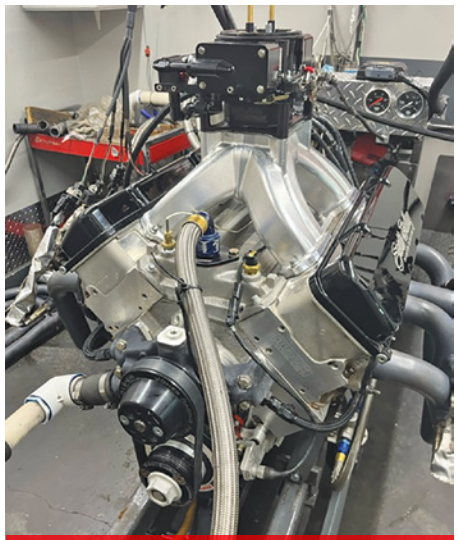
Bailey did some drag racing, while Poe had more experience behind the wheel of modifieds and street stocks.

Bailey's interest in building dirt racing engines goes back to the late 1980s, but he "got serious" about it approximately 15 years ago, when he began buying more equipment. The shop today is loaded with boring, honing, seat-and-guide and surfacing machines, a few Bridgeport mills, and a Stuska Dynamometer.

A turning point for the business was when Poe "darkened my doorway," Bailey said, joking that he's never allowed him to leave.

They knew of each other before then through racing circles, but one day Poe, who worked long hours in industrial machining and fabrication, went looking for a closer shop to machine his racing components and drove to SBRE, about 15 miles away.

"We just kind of started helping each other at night and on the weekends," Poe said. Before long, "we had more work than we could deal with just one of us."



Despite supply chain and parts supply challenges, SBRE has done whatever it takes to make sure none of its customers was out of an engine through the past three years, Josh Poe said.

The seven years since have been a "godsend," Bailey said about the help from Poe. "It really grew from there. It wouldn't be what it is without Josh.

"I think it's both of our passion," he added. "We complement each other very well."

THE DIRT MARKET

Despite the struggles with parts availability and rising costs in racing, business is humming at SBRE. "Things are very expensive, but some of our series in the Midwest are doing a good job," Poe said, noting that SLMR has increased payouts and is enjoying strong car counts.

Shelby Cooper, a representative of the series, said the start pay has been raised by $100, to $500 for 2023, the increase made to help those in the regional racing series offset rising costs.

She noted that the SLMR Hoker Trucking East Series had an average of 33 cars for the 2022 season, and the Malvern Bank West Series had 27, each increasing by a few cars from the season prior. The series' highest car count in 2022 was 49.

Poe pointed out that despite its pricey buy-in, dirt late model racing still receives plenty of attention. "The expense is getting pretty close to intolerable, but people are still wanting to do it," he said.

He believes its popularity among spectators is based largely on entertainment value. "They have a product that people want to watch," Poe stated.

More than just the thrill of fast cars, fans make a connection with the drivers, he explained, traveling up to a few hours to see top competitors from the region or even the nation.

"They can interact with their favorite drivers and teams by going right down in the pits and talking to them," he said, "whereas obviously in other professional sports settings that is far more difficult."

He believes the diehard race fan is gravitating away from the "NASCAR-type stuff" and finding local heroes who they know support racing in their area. As business owners get out of the driver's seat and put younger talent into their race cars, they stay involved at the track.

"I feel that the fans have some

"THINGS ARE VERY EXPENSIVE, BUT SOME OF OUR SERIES IN THE MIDWEST ARE DOING A GOOD JOB."

background knowledge of who they are rooting for each week, making them look forward to the next race on the schedule," he said.

There remains, however, a good mix of veteran drivers and young talent, Poe noted. "It's nice to see the guy who's expected to win have a challenge from a young rookie with maybe an underfunded team giving it everything they got," he said, further building the fan base.

MLRA currently has an unusually high four legitimate drivers competing for rookie of the year. "Josh and I grew up working and spending that money to go race. It's changed now; these younger kids are racing on their families' money," Bailey said.

With today's costs it would be impossible for a 20-year-old driver to fund a car without family help, Poe added. "In our day, it was possible at a certain level. Now, it's not even fathomable."

R&D WORK

For their part in helping customers thrive, SBRE has spent time in the past five years trying to make the most of the SLMR series restrictor/governor plate rule. "We've had a lot of success. We've done a lot as far as R&D work to stay ahead," Bailey said. "I think that's probably been our highlight."

Time on the dyno and work specific to the intake and the governor plate rule has paid dividends for SBRE. As a result, the company has won numerous engine builder of the year awards for the series, which races at tracks across Iowa, Missouri, Nebraska, South Dakota, and parts of Kansas.

To stay ahead in that market, you first have to figure out what doesn't work, Poe stressed. "That's frustrating and very time consuming," he said. "The gains are small

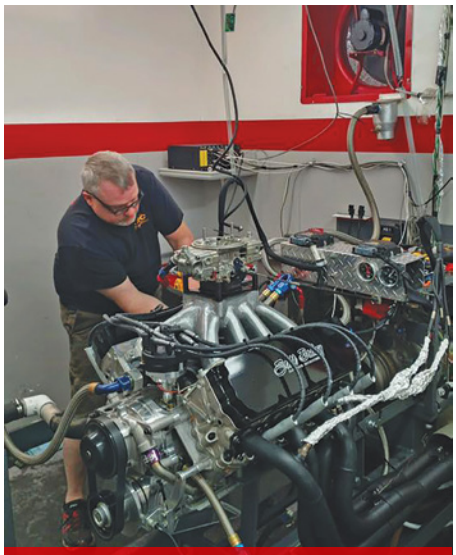
and don't come easily."

The goal of the restrictor rule is to keep all the engine packages at a certain power level, even though anything from a crate engine to unlimited cubic-inch engines are permitted.

"The rules package is very fair, but our customers would come to us and have us look at those rules and say, 'Given these rules, which engine package would you choose?'" Poe said. "Obviously we'd pick one we thought we could squeeze a little harder."

R&D is important, but so is time spent at the track. "That's one of the most valuable aspects of what we do," Poe said. "I truly feel like that's why a lot of our customers are here, because they know that Scott's going to be at a majority of the races they're at."

The next new customer could be parked right beside a current customer in the pits—as was the case a few years ago, when Bailey found himself at an MLRA race at Lucas Oil Speedway, among SBRE's local tracks about an hour away in Wheatland, Missouri, when he helped a driver get his engine back together. Since then, that team has purchased five new powerplants from SBRE.



Time on the dyno and work specific to the SLMR's restrictor plate rule has paid dividends for Scott Bailey Racing Engines. The company has won numerous engine builder of the year awards for the series.

PARTS CHALLENGES

Poe estimates SBRE could have built 30% more new engines in recent years had supplies been adequate.

Parts availability will remain a challenge throughout 2023 and likely beyond, according to Bailey and Poe. "We are still struggling with that a little bit. We used to be able to—start to finish—pick up the phone, order everything you need to build a dirt late model engine, and most of the time have it here in three weeks to a month," Poe said. "Now the parts just aren't readily available."

Specifically, suppliers are having trouble getting the raw material to build crankshafts. And Brodix, as the sole supplier of aluminum blocks and cylinder heads, is "carrying the weight of the world right now," he said.

"It's a challenge getting things in a timely manner to meet the demands of the customer, for sure. A lot of times we have to tell them things they don't want to hear, but that's the reality," Poe said.

Peter Harris at Crower Cams and Equipment Co., the San Diego, California-based manufacturer of race engine components, offers the same advice to its customers, which include SBRE.

"Plan ahead," Harris said. "Prepare the customer to have to wait."

He said shops like SBRE that build mostly similar engines are in a bit better position. "The only guys who get parts on a really reliable basis are those who use a lot of the same parts," he said.

While larger shops face impossible odds in keeping customers supplied with engines, SBRE has done whatever it takes to make sure no one was out of an engine through the past three years, Poe said.

"We were able to stay in contact with our customers," he said.

"It was an extreme amount of stress," Bailey added.

For 2023, the lead on crankshafts remains "out there quite a ways," Poe said, about four months when we spoke in mid-March.

"Brodix has done a good job ramping up production, blocks are becoming more readily available, and the cylinder heads are OK," Poe said. "We're still seeing some long lead times with custom-made rocker arms."

For things like titanium valves, the raw materials are rare, as are the suppliers, so

Dirt late model racing's popularity is based on entertainment value, Josh Poe believes. "They have a product that people want to watch." Plus, fans can "interact with their favorite drivers [like Tad Pospisil, seen here] and teams by going right down in the pits and talking to them."

options are few, Poe noted. “I think things have stabilized to a certain degree. We’re not running out. During the height of the Coronavirus during the lockdown, we ran out of simple things like engine bearings and rear main seals.”

Still, “the crankshafts, the blocks, and the rocker arms are going to continue to be a problem for quite some time,” Poe added.

Bailey said piston companies have done a “real good job” getting caught up, with current lead times of eight to 12 weeks after having been considerably longer.

Harris from Crower agreed that crankshafts and rocker arms are among the parts that are most difficult to get because of the time it takes to produce them and their many varieties.

SMALLER, BETTER

From 1 a.m. phone calls from teams traveling track to track, to putting every refreshed or new engine on the dyno before it leaves the shop, SBRE is succeeding because of its personal connections.

“We know most of our customers like family,” Poe said. “Most of the dirt late model teams have at least two engines, if not more, so we have a lot of repeat customers.”

They also know, however, that every customer is unique. “We don’t build cookie-cutter engines; we listen to our guys,” Bailey said. “We understand there are different driving styles; drivers expect and want different things out of their engines. We’re not one to say, ‘Well, so and so is winning with it like this.’”

Not that larger shops ignore their customers, it’s just impossible for them to tailor their engines and manage everyone’s needs around the clock, according to Bailey and Poe.

For SBRE, this personal connection has been vital over the past three years. Poe recalled the effort to inform customers about longer timeframes to get engines. “If we don’t get them that information, we’re leaving them vulnerable,” he said, “and they’re going to call with demands that are impossible to meet because they didn’t know the situation. This way, they have the information they need to make choices for their team.” PRI

GOING THE DISTANCE

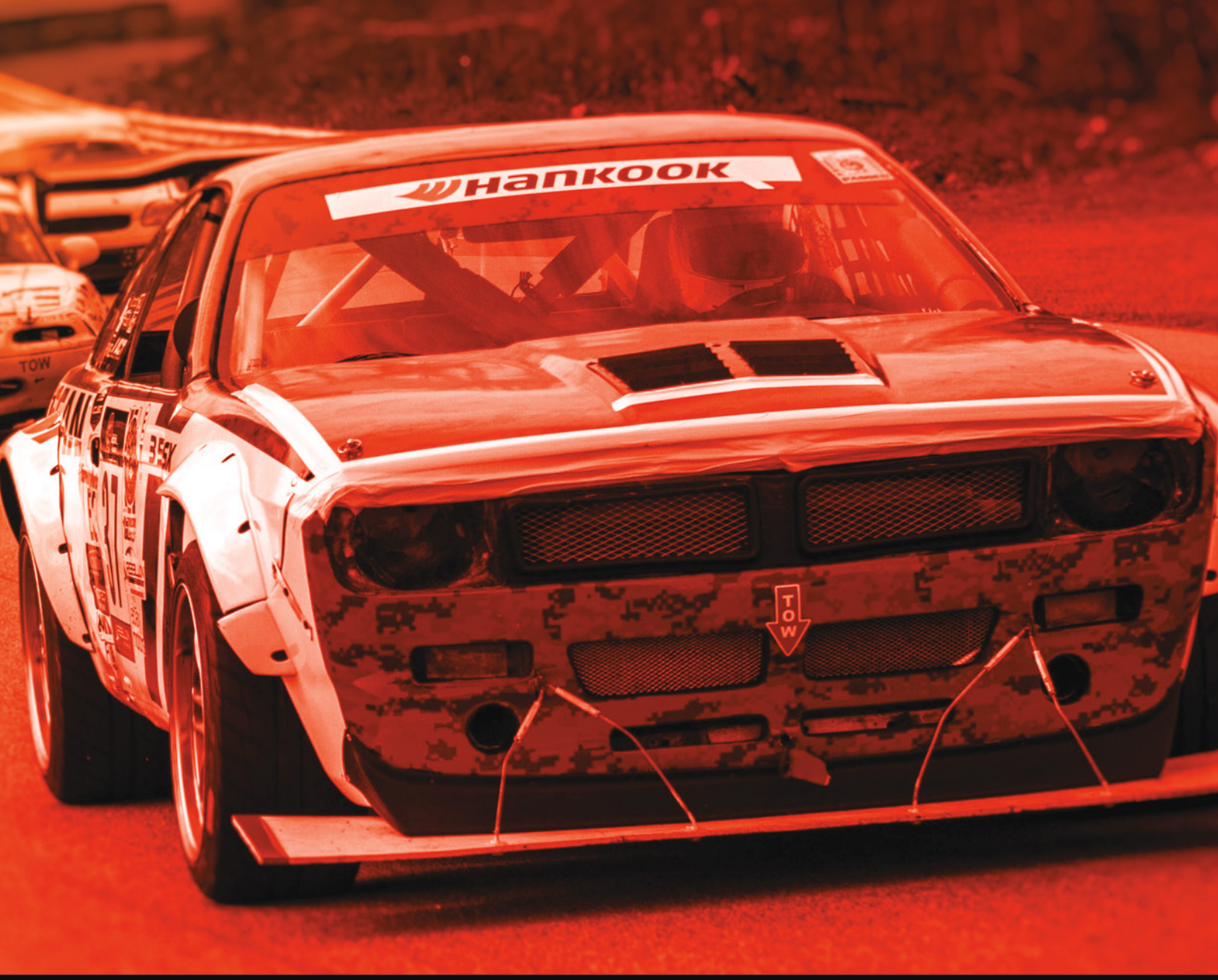
WHILE SOME BUDGET-FOCUSED ENDURANCE SERIES TAKE AN ANYTHING-GOES, LAP-TIME-BASED APPROACH TO ELIGIBILITY AND CLASSING, OTHERS USE PRICE CAPS OR PERFORMANCE INDEXING SYSTEMS THAT ARE DESIGNED TO STRIKE A BALANCE BETWEEN COST AND COMPETITIVENESS.

By Bradley Iger | Photo courtesy of Adam Babington and Lucky Dog Racing League

Nobody has ever claimed that racing is inexpensive, but amongst its various disciplines, road racing can be particularly bruising to one's wallet. Even for those looking to compete at the grassroots level, wheel-to-wheel racing with sanctioning bodies like Sports Car Club of America and the National Auto Sport Association has long been a costly proposition that's simply out of reach for many would-be participants.

As a result, a group of racers decided to take matters into their own hands and created the 24 Hours of Lemons back in 2006. In contrast to traditional club road racing, Lemons shifted the focus away from out-spending the competition with a purposely low-cost alternative where the top priority was simply having fun at the track with your team and the wider racing community.

The series has inspired others to follow suit in the years since, and these days a number of different options exist for competitors who want to get involved in endurance racing without breaking the bank. Although each series takes a slightly different approach to the overall concept, the primary goal of making wheel-to-wheel road racing more accessible remains the same.



24 HOURS OF LEMONS

Jay Lamm said that the idea to create the budget endurance road racing series 24 Hours of Lemons in Emeryville, California, was inspired by the frustrations that he and his friends shared about the various motorsports events they were participating in.

"People were using their checkbooks to compete rather than their own skills and creativity," Lamm said. "This just seemed like a fun, quirky way to take the checkbooks out of the equation. Let's drive cars where we don't really care what happens to them. If something blows up, no big deal."

The first race was intended to be a one-time event. Lamm and his friends had no aspirations of creating a lasting, organized series. But Lamm's background in automotive journalism put the 2006 event on the radar of some colleagues who wanted to get involved as well. "It was supposed to be 12 cars. I was going to rent a little circle track, and we were going to have a fun weekend. But as we started putting it together, more and more people wanted to do it and asked if we had room on track for another car. We actually wound up having 33 cars at that first race."

Word quickly spread to the wider automotive community after those journalists published their stories from the event, and a flood of racers wanted in. "It wasn't intentional on our part, but it became clear, in retrospect, that there was a larger issue in road racing. If you want to race dirt track, for instance, there's always a place you can go and figure what you need to do in order to participate. But road racing—and particularly endurance road racing—always had this artificial mystique around it that made it seem impossible to get there. It was just wrapped in this sense of exclusivity. More than anything else, the psychological barriers were very high. By making this thing cheap and funny, we kind of addressed that

The 24 Hours of Lemons got its start in 2006 as a contrast to traditional club road racing. It's a purposely low-cost alternative where the top priority is having fun at the track.

without even knowing it."

The series puts a $500 cap on the purchase price of teams' cars, and for every $10 they go over that cap, the team is given a penalty lap. While the fun-loving nature of 24 Hours of Lemons brings with it a sense that the events are more about the experience than where a team could potentially place in a given event, he admitted that there are some who are there to win.

"Every car goes through tech inspection at every event to be checked for safety and re-judged for its value. There's basically two sets of cars and teams that show up: About 80% of the field has no chance of winning A, B, or C class. Whatever class we put them in, they just don't have a prayer. And frankly, we don't worry about those cars too much. If they overspend, or if they've got a 'cheaty' motor, it doesn't matter if they have no chance of winning. But there's also a much smaller set of teams that are going to be competitive in their class, or even for an overall win, and with those teams we need to be a lot more strict. 'You say it's a $500 car—do you have documentation that proves that? You say you sold off this expensive part to some guy—do you have documentation of that?' But the fact of the matter is, a lot of the expensive, cheaty stuff that people do doesn't improve their chances. In most cases it harms them. Being reliable and staying out of trouble is way more important than having an extra 30 horsepower."

As Lamm mentioned, teams are allowed to sell off parts from a car to lower its effective value. "So, for example, if you buy a $1,000 car and can prove that you sold the seats to someone for $500, then we consider that a $500 car." Components that are engineered by the teams are also not counted against the value of the car.

"If you want to put on forced induction, fine. Do it without overspending the limit, and show us how you did that," he continued. "We have a team with an Audi A6 that's using an active aero system made from snowmobile parts that they mounted in the back seat. Knock yourself out—just don't overspend the limit."

He also pointed out that teams that aren't concerned about actually taking home a win have plenty of incentives to bring out a car and compete. "We have plenty of guys and gals who show up with cars that regularly get a lot of penalty laps, and they're never going to be in contention for a win. There are a lot of other awards—there are trophies for making everyone laugh, or for cooking a good BBQ, or for making some kind of heroic fix on your car. A lot of different things can motivate a team, but ultimately the main idea is to go out racing with your friends for a weekend and have a good time."

When Jay Lamm and his friends created the 24 Hours of Lemons, they expected 12 cars at what was to be a one-time event. More than 30 cars showed up, and the series has grown ever since. "Ultimately the main idea is to go out racing with your friends for a weekend and have a good time," he said.

CHAMPCAR ENDURANCE SERIES

Founded in 2009 and formerly known as ChumpCar, the ChampCar Endurance Series based in Arrington, Virginia, is a not-for-profit, member-owned club that essentially started as a spin-off of the 24 Hours of Lemons series. The idea was to create a series for teams that wanted to take the racing a little more seriously while still maintaining a similar approach to costs.

"Although we have classes, they're kind of secondary here," said Dana Morrison. "Our structure is built around the idea that every single car can run for the overall win at an event. The system is centered around equalizing all of the cars in the race so that any car that a team chooses to run could potentially be an overall winner."

During the ChumpCar days, the series put a $500 market value price cap on the cars that teams could use—a concept borrowed from the 24 Hours of Lemons series—but Morrison said that they eventually scrapped that idea entirely, choosing instead to establish a Vehicle Performance Index (VPI) system that would assign a point value to a given car based on its performance potential.

The ChampCar Endurance Series created a Vehicle Performance Index to classify its entries, a metric based on the E36 3-Series BMW. "We looked at its performance and potential lap times and valued every other car off of that E36 metric," explained Dana Morrison. Photo by Bill Strong/ RacingStrong LLC.

The series essentially caps a given car's VPI at 500 points, and penalty laps are given to teams for every 10 points over the limit that their car exceeds. If a car is valued at a VPI of 530, for example, that team would start a typical ChampCar race with three additional penalty laps. For races that are longer than eight hours, that penalty is increased—12-hour races increase the penalty to one-and-a-half laps for every 10 points over the mark, while 14- and 24-hour events raise that figure to two laps.

"When we adopted that system, our president at the time selected the BMW E36 3-Series as the benchmark," Morrison explained. "In other words, if you do nothing to this car other than basic race prep and the required safety upgrades, that's your 500-point car. We looked at its performance and potential lap times and valued every other car off of that E36 metric."

While that obviously encourages minimal performance modifications for that particular vehicle, the situation is substantially different for other popular platforms. "The idea was not to just say, 'Okay, you need X amount of

The idea behind the ChampCar Endurance Series was to create a series for teams that wanted to take the racing a little more seriously than the 24 Hours of Lemons while still maintaining a similar approach to costs. Photo by Bill Strong/ RacingStrong LLC.

horsepower in order for, say, a Miata—which has a VPI value of 250—to make the same power as an E36,'" he continued. "It was more about how these teams would choose to set up the car in order to run similar lap times. One Miata team may decide they need power, but another might want aero, adjustable suspension, and upgrades that will improve durability."

Modifications are assigned a specific point value—typically between 10 and 50 points, depending on what the modification is. While ChampCar allows some engine upgrades, the point structure is designed to encourage teams to avoid touching engine internals. "So, a wing or a splitter will be 10 points, while coilovers are 10 or 20 points per corner, but a camshaft swap might be 50 points," said Morrison. "We want the internals to remain mostly stock because ChampCar is supposed to be a fun series. I don't want this to become a place where we have to tear down engines and start measuring components. We rely on our competitors to adhere to the spirit of the rules and the series, and we don't want to be sending out engines to machine shops three days after the event while we wait to award a race winner."

He also noted that engine swaps are usually valued at about 50 points for the swap itself, and the additional horsepower gained by the swap typically adds to the point value on top of that. To give teams an idea of what a given engine swap will cost them in points, the series provides teams with an online calculator.

Safety elements, which include brake upgrades and the mandated six-point roll cage, do not affect a car's VPI. Although the structure encourages teams to keep their cars at or under 500 VPI, Morrison explained that some will choose to accept the lap penalties in order to run the car how they want to. "If a car is over 1,000 points, it goes into what we call our Exception Class. We designed this class for people who might have a race car from another series that they want to try out in ChampCar. The EC class is scored and the first-place finisher in the class gets a trophy, but they are not scored amongst the rest of the field outside of their class. It's basically its own race within a race, and it allows people to try out the series without making major changes to their existing race car."

LUCKY DOG RACING LEAGUE

Like ChampCar, Lucky Dog Racing League in Martinez, California, was created to give would-be Lemons racers a series that takes the racing a little more seriously, but stops short of the perceived complexity, cost, and politics involved in SCCA and NASA club racing.

"The concept behind Lucky Dog has always been about being easy to work with," said Cathy McCause Fuss. "What we saw was that complex rulebooks and car evaluation processes in other series had gotten to a point where folks didn't really understand what kind of car they needed to build, and new car builds were starting to level off as a result."

To address that, the series is designed around two main rules: All cars must be a 2006 model year or older, and all cars must run the series' Hankook RS-4 spec tire. To keep the playing field level, qualifying sessions are held before each race, and cars are categorized into A, B, and C classes based on the resulting lap times.

"We're looking at average lap times for whatever has shown up at the track for a given event," Fuss explained. "If they go out and qualify as a Chihuahua but prove to be a Greyhound in the race, I'll move them up

The Lucky Dog Racing League approaches racing a little more seriously than the Lemons series, but stops short of the complexity, cost, and politics of traditional club racing. Teams aren't confined to a specific cost or performance cap. "It's more about reliability and carefully executed pit stops," said Cathy McCause Fuss. Photo courtesy of Dak Snow and Lucky Dog Racing League.

a class—or even two classes, depending on where they're at. The same thing applies the other way around—if a team has a great qualifying session, but they've lost a cylinder during the race and they're running like a Basset Hound, we may move them down for the day. Classing typically just comes down to the capabilities of the cars and their drivers."

That means that teams aren't confined to a specific cost or performance cap, but Fuss is quick to point out that endurance racing formats tend to favor durability over pace.

"Generally speaking, there are no

"IT'S ALWAYS INTERESTING TO SEE WHO THE CHAMPIONS ARE AT THE END OF THE YEAR. IT'S USUALLY NOT THE TEAMS THAT SPENT A LOT OF MONEY DOING CRAZY THINGS TO THE CAR."

penalties for car modifications. There's a large number of E36 and E46 BMW 3-Series cars—probably half of the field is BMWs at this point—and Mazda Miatas have always been part of the landscape. We have BMWs and Miatas that are mostly stock, and we have Miatas that have GM 2.4-liter Ecotec engine swaps as well as E36 BMWs that have LS swaps. A lot of these folks are coming over from disciplines like autocross and circle track, and they feel like they've got to build a really fast car in order to be competitive. But what they eventually come to understand is that it's more about reliability and carefully executed pit stops. It's always interesting to see who the champions are at the end of the year. It's usually not the teams that spent a lot of money doing crazy things to the car. The LS swap thing has gotten incredibly popular in the series, but doing that tends to introduce reliability problems."

As with other series, Lucky Dog requires safety equipment like SCCA-spec roll cages,

American Endurance Racing uses qualifying session lap times and historical performance data to classify vehicles rather than limiting teams' spending through a price cap or Vehicle Performance Index. "People coming from grassroots series to race with us like having the freedom to build and spend as much or as little as they want to," said John Kolesa. Photo courtesy of AER, Rudy Archuleta.

and it also requires a dash bar as part of that system. Fuel cells are limited to 24 gallons, and Fuss noted that most race teams have an in-car fire suppression system installed as well.

As a result of the series' design, tech inspection focuses mainly on the safety elements of the car, but there is a ceiling for the performance capability of the cars that teams can race with Lucky Dog. "If teams are running times that are much faster than the rest of the field, they may be hit with a Super Dog penalty," said Fuss. "We give teams four instances to hit Super Dog, and then we pull them off of the track for the day. This is ultimately an amateur racing series, and a newer driver is not going to understand the difference between a skilled, careful pass and feeling like their doors were just blown off. We don't want to terrify the core group of racers with cars that are going crazy-fast."

That said, the faster A-Class cars in the Lucky Dog series tend to have race-prepped suspension setups, well-sorted aerodynamics packages, and a power-to-weight ratio that keep things interesting. Fuss told us that the spec tire rule tends to be the greatest equalizer. "That has helped to manage the speed in my fields, and it has also helped with costs," she said. "I don't want this to be a 'wallet' race series. I have to regularly remind these teams that IndyCar is not going to be out there scouting you. You're racing for trophies made from car parts that look like dogs."

AMERICAN ENDURANCE RACING

American Endurance Racing (AER) in Philadelphia, Pennsylvania, is another series that uses qualifying session lap times and historical performance data to classify vehicles rather than limiting teams' spending through a price cap or VPI. John Kolesa said that American Endurance Racing tends to appeal to sportsman-level road racers—those with club competition licenses who are looking to build and tune a car in their own shop and campaign it at a level beyond grassroots racing. "Performance-wise, there are a lot of cars in our series that I'd call 'BMW Spec E46 Plus'—cars that might've started out as Spec E46 cars that have been modified to be a bit faster and more durable for an endurance format."

AER requires teams to use a tire with a treadwear rating of 200 or higher, but outside of that, Kolesa said that teams are free to do what they'd like. "The modifications don't necessarily affect classing—it's done strictly by lap times. Logic dictates that performance modifications will generate faster lap times, and we reserve the right to move people around if they're much faster in the race than they were in qualifying, but that doesn't happen very often."

While that opens up teams' options for powertrain upgrades, he told us that most focus on suspension, aerodynamics, cooling, and other improvements that will keep the car happily humming along for eight hours on-track. "One thing we often hear from people who're coming from grassroots series to race with us is that they like having the freedom to build and spend

"I HAVE TO REGULARLY REMIND THESE TEAMS THAT INDYCAR IS NOT GOING TO BE OUT THERE SCOUTING YOU. YOU'RE RACING FOR TROPHIES MADE FROM CAR PARTS THAT LOOK LIKE DOGS."

as much or as little as they want to," Kolesa explained. "They don't have to use junkyard stuff, and they also don't have to use the most expensive stuff out there in order to make the car competitive."

Cars in the series get an annual safety tech inspection, and teams supply the series organizers with build sheets so that they know what to expect, but the on-track performance is ultimately the biggest factor when it comes to determining which class a team will land in. "We have an analytic that we can run that sorts the field in more than a dozen different ways, and that includes some weighed averaging of all the drivers on a team during their qualifying sessions. That helps us look at a team's overall performance rather than just the fastest driver's fastest lap. We are trying to group cars so that, at the end of eight hours, everybody in the class is pretty close to each other." PRI

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FUEL
TO
FIRE

EFI SUPPORTS MORE HORSEPOWER NOW THAN EVER, AND AFTERMARKET COMPANIES ARE RACING TO DEVELOP LARGER AND IMPROVED INJECTORS ALONG WITH MORE SOPHISTICATED ELECTRONIC CONTROLS.

By Mike Magda

At the start of every NASCAR season, a couple of teams will each send 100 or so fuel injectors to the Fuel Injector Clinic (FIC) in Hobe Sound, Florida. Using a purpose-built test bench that cost $250,000, Randy Earle and his crew will evaluate and record extensive data for every injector.

"The teams want us to pick the very best set of eight, or if they have two cars, then the two best sets of eight," explained Earle, noting that teams are prohibited from modifying the injectors, which accounts for the intense selection process. "We match the best eight for flow at less than 1% difference, and they're matched for dead time as good as we can get it, hopefully around 2%."

Such precision is needed in many of today's highly competitive racing divisions where the rules allow or mandate electronic fuel injection (EFI). A set of injectors off the shelf could vary around 5% flow, and the open-shut time could vary as much as 38%. A set of matched performance injectors should be close to 2% for flow rate, yet FIC has seen the dead times off as much as

30%. Such a discrepancy can lead to tuning headaches or a loss of overall efficiency.

"How many times have you seen a guy lose a race on the last lap because the car runs out of fuel?" asked Earle. "The more efficient the fuel injectors, the better the engine will be in terms of fuel economy and how that race car performs."

RESULTS FOCUSED

The EFI market has expanded considerably in the past decade, and so has the need for race-worthy components. Only a handful of aftermarket companies used to offer performance replacement injectors and racing-quality electronic control units (ECU). Other support equipment like throttle bodies, dedicated intake manifolds, and high-pressure fuel pumps were also in limited supply.

A couple of trends set the stage for the increased interest in EFI. First, speedy and cheap import cars that were all fuel injected became popular with younger enthusiasts who rebelled against big block engines and muscle cars. This next-generation hot rodder was brought up on laptops and video games and had no fear of fuel and ignition maps.

"IT'S KIND OF A WHOLE NEW EMERGING MARKET THAT'S CERTAINLY OUT THERE FOR THE TAKING."

Then came huge boost numbers from the explosive growth in outlaw and small-tire drag racing. Even though these racers were bullish on V8 engines and classic doorslammer cars, boost from turbos and powerful centrifugal superchargers required precise fuel delivery that even the best blow-through carburetor couldn't deliver.

Along the way, NASCAR and NHRA Pro Stock converted to EFI, basically completing the circle of technology in the motorsports arena and encouraging continued development.

More fuel is the mantra of today's EFI development. That means larger, more

Holley has been a leader in EFI development, so much so that many racers don't know the full list of features available in the company's performance ECUs. Some of the confusion may originate in the early configurations of EFI setups that had separate boxes for different functions. Current ECUs combine many functions related to ignition timing, nitrous delivery, traction control, and more.

responsive injectors that can handle different fuels, such as E85 and methanol. Also, there is growing interest in direct injection (DI), a form of fuel injection that delivers fuel directly into the combustion chamber under very high fuel pressure. Many of today's high-performance factory cars have DI, and customers want even more performance from those systems. Regardless of the delivery method, aftermarket ECUs have increased in versatility and boast software advancements that support increased power levels.

"We'll have software updates for our current products," said Doug Flynn of Holley Performance Products, Bowling Green, Kentucky. "But I can't talk about the new products we're working on."

Holley has been one of the leaders in EFI development, so much so that many racers don't know the full list of features available in the company's performance ECUs.

"We have a ton of stuff now that we have given the racers, and I don't think 80% know half the features in it today," explained Flynn. "That is proven because people say to me, 'Hey, you need to do this, this, this, and this.' But that is what we have had for the past two years!"

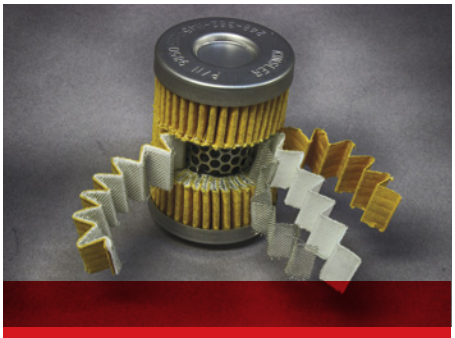
Some of the confusion may originate in the early configurations of EFI setups that had separate boxes for different functions, such as start retard or nitrous retard. Current ECUs now combine many functions related to ignition timing, nitrous delivery, traction control, and more.

"Everybody has too much power, and getting that power managed down the track through engine control, transmission control, transmission dumps, converter lockups, electronic shocks—all that stuff," explained Flynn. "Having all that control plus data acquisition in one piece of software is, I think, probably the biggest area that people are looking for today."

Supporting technology for EFI systems has also improved greatly over the past few years, starting with more powerful brushless fuel pumps with PWM control that can be managed with the ECU. Even fuel filters had to be designed to maintain precision in the fuel injector.

"The number-one problem for any fuel system is dirt," explained Brad Cauzillo of Kinsler Fuel Injection, Troy, Michigan. "All EFI injectors and pressure-relief valves need 3-micron protection, but 3-micron filters plug up too quickly. So, most racers used 10-micron, which is too coarse."

Kinsler responded with a new 10/3 filter for NASCAR teams that featured a 10-micron premium paper top layer that removes about



"The number-one problem for any fuel system is dirt," explained Kinsler Fuel Injection's Brad Cauzillo. Some filters are too fine and will plug up; others are too coarse and won't filter properly. Kinsler has developed a line of filters with a finer bottom layer beneath the top layer, a combination that removes about 95% of debris.

95% of the debris. Then there's a 3-micron precision lower layer.

"NASCAR Cup teams have found this filter to work so well that about 75% now run it," added Cauzillo. "It's also suitable for other EFI systems."

An improved pressure relief valve is another upgrade that has been critical to high-power EFI systems. Carbureted systems used a pressure regulator that held the fuel back in the system to achieve the desired pressure. In EFI systems, a pressure-relief valve will bleed fuel out of the system back to the tank to maintain the required pressure.

"It is important to control the fuel pressure precisely," said Cauzillo. "If the pressure to the injectors varies, then the fuel flow through them will vary."

Working with the GM IndyCar program, Kinsler designed a more precise valve. Most valves rely on a ball bearing to close off the seat and control the outlet flow. But if the ball can't find the center of the seat, that design will show a large hysteresis curve; that is, the opening and closing pressures will differ dramatically. Kinsler's design features a flat-faced pintle that swivels freely down to a flat, precision-ground seat.

"It closes precisely every time," said Cauzillo. "There has never been a failure in the field among the 10,460 valves shipped to date."

Another component that has been upgraded is the throttle body. Even though its basic function is to control the airflow to the intake manifold plenum, there are options

One of the "biggest areas people are looking for today," said Holley's Doug Flynn, is power management down the track "through engine control, transmission control, transmission dumps, converter lockups, electronic shocks—all that stuff. Having all that control plus data acquisition in one piece of software."

FiTech is helping racers make the conversion to EFI while retaining their fuel cell with an expanded line of fuel pumps. "We have a really trick pump that uses the most common bolt pattern for fuel cells, and it can support 1,600 horsepower," said Mike Wahl.

in design and size. Most throttle bodies feature round throttle plates in one-, two- or four-blade configurations. Other throttle bodies have a single oval plate. As with other engine components, throttle bodies are being manufactured from billet aluminum.

"We have size options, and durability is a priority with so much boost these days," said Joe Hilerio of BLP Racing Products, Orlando, Florida. "We use a proprietary polymer bushing that allows us to tighten up our tolerances around the shaft."

One option available to some V8 racers is eight throttle bodies, or an EFI system with individual runners (IR). Hilborn, which is a division of Holley, offers a version of its big block Chevy fuel-injection setup with ram tubes. This classic look is reminiscent of the 1960s gasser cars that ran mechanical fuel injection, yet it can also offer performance advantages when rules allow an IR system.

"It is being used in racing and actually has really good performance," said Flynn.

THE CRUSADE FOR EFFICIENCY

Electronic fuel injection is a key reason why the thermal efficiency of the gasoline internal combustion engine (ICE) has improved over the past few decades, but there remains a large gap with other forms of vehicle propulsion. Conventional wisdom said ICE are about 20% thermal efficient. That is, for every gallon of gasoline, only 20% of potential energy becomes mechanical energy used to propel the vehicle. Much of the wasted energy is heat dissipation in addition to losses due to friction, drivetrain, etc.

Diesel engines are said to be in the 40%–50% range of thermal efficiency. Formula 1 engines are also in this range, but they boast advanced design, exotic materials, designer fuels, direct injection, electric turbochargers, and energy recovery systems. Still, ICE are slowly gaining efficiency as other technology is passed down, including fuel injector design.

"To improve the thermal efficiency of the system, I think that's more engineering in other areas of the engine," said Doug Flynn of Holley Performance Products, Bowling Green, Kentucky. "That being said, when you push the limits of everything that far, you need to make sure your fuel and ignition timing are spot-on accurate."

"We're playing with different angles on injectors and different spray patterns to see if we can get a cleaner shot into manifolds, versus straight down and then the manifold does the work," said Mike Wahl of FiTech, Riverside, California. "We're trying to help out the spray pattern and get it there faster. Jeremy, our engineer and co-owner, is constantly doing testing on fuel injector efficiency and sensory efficiency."

Still, conventional port fuel injection is improving, if only because advanced testing is revealing where to find and correct inconsistencies. "In the early days of EFI, hardly anyone was aware that there were all sorts of fuel-pressure fluctuations at the injectors," recalled Jim Kinsler of Kinsler Fuel Injection, Troy, Michigan.

When an injector is open, a small fixed-size orifice is uncovered, allowing fuel to pass through the nozzle. More fuel-line pressure will deliver more fuel flow, but there are pressure fluctuations as the injector operates.

"These fluctuations are extremely rapid and can only be measured using a super-fast piezoelectric pressure sensor, such as one made by Kistler," said Kinsler. "We once flowed an IndyCar engine that indicated 130 psi on a normal gauge and noticed a little vibration of the needle. Using the piezoelectric sensor, the actual pressure was bouncing between 100 and 160 psi, which is plus or minus 30 psi."

Based on this research, Kinsler helped the race teams he worked with reduce pressure fluctuations and equalize fuel delivery to the cylinders. "The fuel use was reduced, and more power was made," summed up Kinsler.

The future, however, will lead to DI. "With direct injection, there's 1,000 psi," noted Ron Sievers of AUS Injection, Tempe, Arizona. "It's a really good design for fuel efficiency because you're getting the fuel exactly where it needs to be, and it's atomized very well." *—Mike Magda*

"The cost and complexity of the linkage, I think, is prohibitive to gaining a lot of volume. I personally know of some racers that run it, and it actually performs better than other designs, if sized properly.

"The problem with a common plenum in a manifold is that you get a lot of crosstalk," continued Flynn. "It can rob one cylinder of air, and it can even rob fuel from another port. It gets pretty nasty inside there. When you have individual runners, that problem is gone. So if you size the port properly and tune with the trumpet, you can get the best of all worlds. But it's for a naturally aspirated engine. If you want to put on a turbo, you're back to a common plenum."

Over at FiTech, based in Riverside, California, an expanded line of fuel pumps is helping racers make the conversion to EFI.

"We go to PRI every year and hear that someone doesn't want to get rid of his fuel cell to go to fuel injection," said Mike Wahl. "He also doesn't want to run an inline pump. We have a really trick pump that uses the most common bolt pattern for fuel cells, and it can support 1,600 horsepower."

Hilborn, a division of Holley, offers a version of its big block Chevy fuel-injection setup with ram tubes. The classic look is reminiscent of the 1960s gasser cars that ran mechanical fuel injection, yet it can also offer performance advantages when rules allow an individual-runner system.

The majority of aftermarket performance EFI systems are based on port injection with each intake runner having one, two, or even three fuel injectors providing the fuel above the intake valve. Many OEMs have transitioned to DI to improve fuel economy and emissions; however, direct injection is more complex and expensive.

Some aftermarket companies are offering DI-delete kits that plug up the injector mounting location in the cylinder and then repurpose the intake manifold for traditional port injection. Driving this conversion trend is the scarcity of salvaged LS engines and growing availability of used LT engines after GM introduced the DI-equipped LT family in 2014.

"We're diving into the LT engine and selling a complete delete kit. We're getting a lot of circle track guys because they're

If left sitting in a fuel system, ethanol can clog injectors. Randy Earle of Fuel Injector Clinic recommends racers using ethanol fuels "run the car on a regular basis, or start it every two, three weeks. Make sure that it doesn't sit a couple of months. The nice thing about our setup is all of our injectors are serial numbered. So if one goes bad, we can pick one to match your set."

running out of LS engines," said Wahl. "What we noticed on that platform is that everything above the injectors is getting kind of dirty. It's holding all the contaminants from the air. When we do the port injection, we get a much cleaner engine. And it seems they stay tuned, and performance stays longer."

Wahl said that a DI upgrade is in the works at his shop.

Ron Sievers at AUS Injection in Tempe, Arizona, also hints of a DI offering. "We haven't introduced it," said Sievers. "But we know that will be in the future. What we're looking at is taking a DI injector and modifying it, like we do with our other high-performance injectors. But it has a different set of hurdles to overcome because it's a totally different system that runs under much higher pressure. There are a lot of factors to get it right."

AUS specializes in upgrading a factory Delphi injector and offers a wide range of flow rates from 114 lb/hr up to 190 lb/hr. With

a different style Bosch injector as the starting point, AUS can work up to 220 lb/hr. The upgrade starts with a complete disassembly of the injector.

"Some of what we do is obviously proprietary," said Sievers. "We actually re-engineer them to get a specific flow rate. We use the Delphi injector because it has a very fast response time and holds up through the whole cycle. We use all stainless-steel internals, so there are no issues with E85.

"Believe it or not, it started in the marine world because marinas started selling E85," continued Sievers. "When they did that, it was a mess, because E85 is really harsh and busts everything loose. It cleans everything and then pushes debris through the fuel system and clogs everything up."

While E85 is generally used for street-strip applications, hardcore racers will use ethanol and need to be aware of similar issues if the injector isn't prepared properly.

"If ethanol sits around in those injectors, then we recommend that you run that car on a regular basis, or start it up every two, three weeks," said Earle. "Just make sure that it doesn't sit a couple of months. The nice thing about our setup is all of our injectors are serial numbered. So if one goes bad, we can pick one to match your set."

Larger injectors that are compatible with all fuels will likely be an industry priority in the future, as will injectors that receive blessings from the EPA and CARB. Another growing opportunity will be powersports.

"Right now, it's looking at what those customers are needing in terms of their power goals, trying to figure out the fitment issues in their applications and what sizes they need," said Earle. "Then we have to figure out what injectors they need and determine the data needs for the tuning process. It's kind of a whole new emerging market that's certainly out there for the taking." PRI

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SQUEEZE PLAY

By David Bellm

NITROUS OXIDE IS A SIMPLE, PROVEN WAY TO ECONOMICALLY ADD SIGNIFICANT POWER, BUT IT MUST BE SET UP AND MANAGED PROPERLY TO SAFELY ACHIEVE ITS FULL POTENTIAL.

"There's nothing you can do to a motor that I can't do a whole lot cheaper, a whole lot faster, and a whole lot easier with nitrous," declared Ernie Wrenn of Compucar Nitrous Systems, North Augusta, South Carolina.

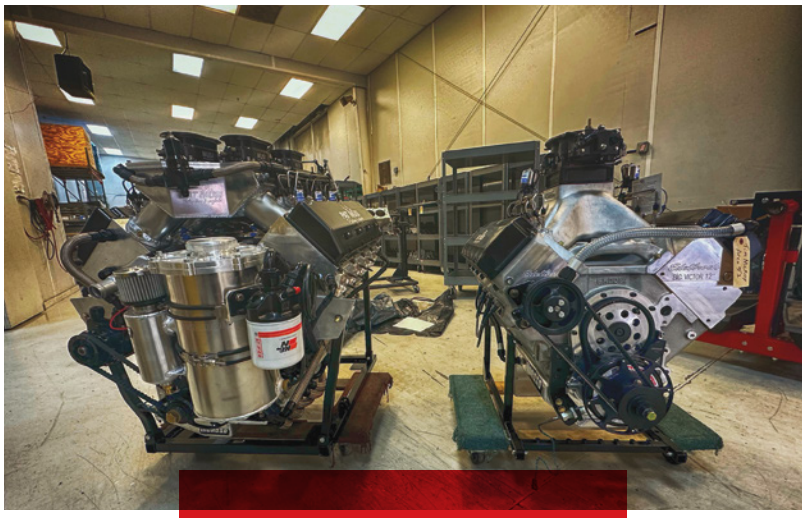
In that spirit, nitrous systems surely had to have been dreamed up by a sportsman drag racer. The easy, quick, simple, and cheap horsepower of this potent elixir is tailor-made for the average weekend competitor looking for fun and glory without breaking the bank.

But, like most things that are easy, there are still plenty of ways to blow it. And with nitrous, the results of doing so can be catastrophic. To learn more about these potential traps, we called on the experts, including one of today's top nitrous-engine builders and several industry pioneers with decades of experience going back to the formative years of nitrous system development.

Here's what they told us are 12 key steps to success when adding a nitrous system to any sportsman drag car, whether it's a K-motor Civic or a big block Chevelle.

1. GET THE RIGHT MINDSET

It's all about respect, not fear, according to the specialists. "You shouldn't be afraid of nitrous," said Pat Musi of Musi Racing Engines, Mooresville, North Carolina. "Yeah, when you're putting six stages of nitrous on an engine, it's a whole different animal. But a sportsman guy can be running nitrous all day long and be fine. It's not that hard."



"You shouldn't be afraid of nitrous," said engine builder Pat Musi, whose engines are above. "A sportsman guy can be running nitrous all day long and be fine. It's not that hard."

2. CHECK OVERALL ENGINE CONDITION

Adding a hit of nitrous to an engine that's on the ragged edge of grenading generally isn't a good idea, unless it's in pursuit of the final hurrah before sending the engine off to the dumpster. Nitrous has a way of exposing the weak spots in any engine and hastening their demise.

3. STRENGTHEN WHERE NEEDED

No matter what amount of nitrous is added to an engine, cylinder pressures will increase significantly; that's how more power is made. To cope with those additional pressures, a forged crankshaft, pistons, and connecting rods should be considered essential for anything beyond a mild shot of nitrous.

4. SET SAFE LIMITS

One of the biggest keys to successfully adding nitrous to an existing engine is keeping the power increase to reasonable levels. For stock engines, that limit is relatively low. "You can easily get away with a 50-hp shot on four-cylinder applications, a 75-hp shot on six-cylinder applications, and a 100-hp shot on eight-cylinder applications without any concerns," said Dustin Wilson at Holley Performance Products, Bowling Green, Kentucky. "When you get above that, you'll have to start looking into the rotating assembly and other things as far as how the engine is built."

For V8s that have already been fortified somewhat for racing, that safe rule-of-thumb power figure is significantly higher. "If you're going to bracket race, a good number for those engines is about 250 to 300 hp," said Musi. "It's really hard to hurt an engine with that amount of nitrous."

5. PLATE OR DIRECT PORT?

Plate systems are simple and relatively easy to set up, and they don't require the user to remove the intake manifold. In contrast, direct-port systems—also known as "fogger" systems—are more work to install on carbureted engines. "To add a direct-port system to a carbureted motor, you have to take the intake off, it has to be drilled and tapped, then you have to run all the plumbing to it," explained Wrenn.

Despite the additional work required to install direct-port systems, they can offer significant advantages. "You can use a plate system up to about a couple-hundred horsepower," said Mike Thermos of Nitrous Supply, Huntington Beach, California. "But if you're going to really get serious, you need to go to a fogger-type kit where you have individual plumbing for each cylinder, because you can fatten or lean each one as needed. If one's showing you that it's a little bit lean, you can fatten it up. With a plate, you have to fatten up all of the cylinders."

6. WET OR DRY?

Generally, wet systems are best for racers looking to add nitrous to a carbureted vehicle, or one with a stock ECM. Most other engines are best served with a dry system. That said, it's typically worth the effort to add an aftermarket ECM to run a dry system on modern EFI-equipped engines, for the additional control that allows. At the same time, it also adds a valuable safeguard to avoid fuel-distribution issues.

"In fuel-injected cars, the intake runners aren't designed to flow fuel," said Wrenn. "They're designed to flow air. So when you try to put a heavy object into that intake, it falls out of suspension. Then you started having backfires and fires period because

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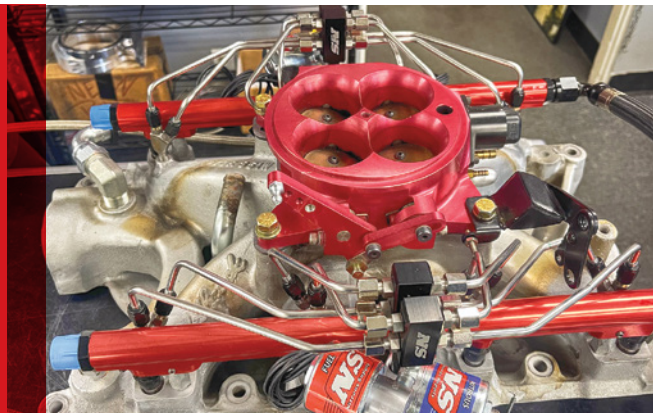

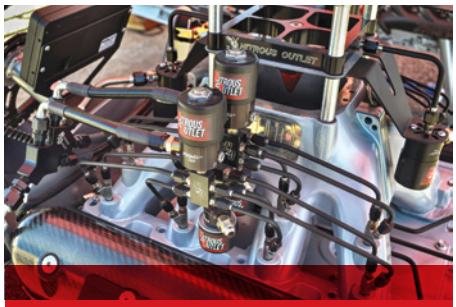

A direct-port nitrous system is more complex to install, but it allows the engine builder to tune each individual cylinder with the precise amount of nitrous needed to optimize performance.

these intakes aren't designed to flow liquid."

7. PICK THE RIGHT CAM

Although many first-time nitrous users start with whatever camshaft they were already running on their engine, it can be beneficial to change it. "Cam timing becomes an important issue with nitrous," said Thermos. "You need to open the exhaust valve a little sooner, because you're done with the exhaust earlier. Plus, the weight of the air coming through the intake tract is a little heavier now, so you might be able to do what we call inertia feed the motor—in other words, hold the valve open a little longer to fill the cylinder better. Overlap also plays a role with nitrous. Shorter overlap tends to work better."

8. SOFTEN THE HIT

Nitrous controllers allow the user to precisely manage the parameters of how nitrous is injected into the engine, and when each stage will trigger on multi-stage systems. This not only helps preserve the engine, but it can also get the car down the track faster by allowing it to hook up better and stay under control.

One method of softening the hit of a V8 or V6 direct-port system is to introduce nitrous on one bank of cylinders when launching and then bring in the other side soon after. "On, say, a 400-hp engine, if you try to turn on 400 hp at one time, it'll probably spin the tires," said Wrenn. "So you have two options—go progressive or bank it. With

banking it, you take the left-hand side, leave with that, and then turn on the right-hand side. It works out because the cylinders in the two banks are actually firing across from each other."

Additionally, the length of the line connected to the solenoid can also make a big difference in how hard nitrous kicks in. This can be valuable in tailoring the response of the system for the car and track conditions. "Our kits come with about 12 inches of braided-steel line," said Wrenn. "If you get to the track and the starting line is absolutely horrible, you can add a 6-inch or 12-inch piece, so it's 18 or 24 inches. You'll still get the same horsepower, but the impulse to the engine is smoother and slower. Then you can do that same little trick down range. So, let's say if you have a two-stage plate, in the transition, when you're changing gears, if the car wants to move around, okay, make the line 18 inches instead of 12 inches."

9. GET THE IGNITION TIMING RIGHT

The biggest killer of nitrous engines is improper ignition timing, according to our experts. Although the specific amount that timing should be retarded varies somewhat from one engine to another, it's recommended to start with an established baseline.

"A lot of guys have this theory that you can run lots of timing advance and compensate with fuel," said Musi. "But it doesn't work like

The length of the line connected to the nitrous solenoid can make a big difference in how hard the nitrous kicks in. This can be valuable in tailoring the response of the system for the car and track conditions.

NITROUS SAFETY

When people speak of nitrous oxide's potential dangers, they're usually talking about how this potent gas can hurt engines. But the plain fact of the matter is that nitrous can also be plenty dangerous to human beings, too. "What you're doing is bolting on a bomb and seeing how far you can go before it goes off," said Ernie Wrenn of Compucar Nitrous Systems, North Augusta, South Carolina. "If you don't understand the basics, that's what gives nitrous a bad reputation."

Although nitrous has been around for decades and there are well-established protocols for using it, injury and death from misuse still occur too often. It has even reached the point where outside agencies have threatened to monitor and control the use of it in automotive applications.

"The dangers need some discussion," said Mike Thermos of Nitrous Supply, Huntington Beach, California. "I've been called on the carpet by the cryogenic companies about what racers do with nitrous. Along with the California Highway Patrol, they said, 'If you don't police your industry, then we're going to police it. And you probably won't like it—every hose and every fitting will have to be sent to a lab and get tested.' It would go from being a $500 kit to being $5,000, which would take it right off the market."

To some degree, the dangers of nitrous are inherent in the technology. Nitrous is stored in tanks under high pressure. If someone accidentally drops the bottle and the valve gets knocked off, the tank instantly turns into a wild, unguided rocket traveling with enough force to injure or kill anyone who happens to be in its way.

But just as bad is the improper heating of bottles, which is commonly done with a propane torch. "I cringe when I see a lot of the stuff the racing industry thinks is normal," said Thermos. "Propane torches boil the nitrous a little bit, and the pressure comes up. But it also anneals the aluminum that the tank is made of. You're actually changing the integrity of the metal. It might not let go until 50 times later. But eventually, it will.

"A lot of guys think, 'Well, nitrous is non-flammable, so I'm okay,'" continued Thermos. "But when it reaches the temperature of 570 degrees, the atoms of the nitrous molecule let go of each other. That's called disassociation. When the molecule breaks up, it expands to 419 times its original size. At that point, the safety valve opens and relieves the pressure. But the safety is only a little quarter-inch hole, and the nitrous expands so quickly that it can't get out of that tiny hole. So it just blows the side of the bottle out."

Fortunately, most sanctioning bodies have very specific rules on how nitrous bottles should be heated. Such rules typically require heating blankets designed for the purpose. However, those also should be watched carefully when being used.

"Even a blanket warmer has to be controlled," said Thermos. "Otherwise it can warm the bottle until the safety blows. It's happened in my shop. I'll put a heater on a bottle, knowing I'm going to take it off in five minutes. Then the phone rings or something and I forget about it. In the back of the shop, I'll hear the safety pop like a firecracker." *—David Bellm*

Using nitrous oxide safely goes beyond not harming the engine. Taking care with handling, installing, and warming the nitrous bottle ensures the safety of those around it.

that. You're increasing the burn rate with an oxidizer, which is nitrous. So you have to fire the charge later. A good rule of thumb for retarding timing is three degrees for every 100 hp you add. So let's just say the motor runs well at 36 degrees of advance and you're going to put a 250-hp nitrous system on it. You would take seven-and-a-half degrees of advance out of it. And that's a pretty known number for all engines."

Additionally, the shape of the piston can significantly influence ignition timing in nitrous engines. This should be factored in when deciding how much to retard the ignition. "Nitrous doesn't like a piston with a dome," noted Thermos. "It wants a clean burn across the cylinder. So if you need to get your compression up, do it by raising the height of the piston. Don't put a big knuckle on the top of the piston, because it has to go around that, and it doesn't have clean combustion. Guys who have domed pistons are the ones who call me and say they have 40 degrees of advance in their motor. That's telling me that the combustion is really inefficient if you have to lead the motor by that much."

10. GET CARB JETTING RIGHT

Adding nitrous oxide to an engine radically alters its balance of fuel and air. So carburetor jetting is vital for its long-term health and longevity. Many racers fear going too lean with the fuel mixture when running nitrous. But more nitrous engines are killed by an overly rich mixture than a lean mixture, said experts.

"When we turn nitrous on, we're bringing 950 positive psi of air at minus 128 degrees in the cylinder," explained Wrenn. "Now you've created a pressure differential below the carburetor. When you do that, the vacuum through the carburetor is going to more than double. Your .090 jet is going to act like it's a .110. So now you've created a problem instead of solving one. The motor is showing that it's rich, and some people start tuning their nitrous system to make up for it. Using nitrous to tune the motor like that is a death sentence."

11. SNEAK UP ON IT

Experts recommend working slowly up to maximum power levels with nitrous. "A big mistake we see is trying to go too big too quick," explained Wilson. "They don't ease into it. They don't see what they're getting into, and they jump straight to the biggest jet. That's really not the best way to handle it. You want to start out with the smallest and work your way up."

12. RECOGNIZE SIGNS OF TROUBLE

Even when gradually building to higher power levels with a nitrous system, it's still vital to learn the signs of when things are about to go wrong. "A very important tool when you're using nitrous is to monitor your crankcase pressure, meaning your vacuum," said Musi. "If you have a vacuum pump on a motor, let's just say you have 12 inches of vacuum—I'm just picking a number. If everything's happy, that thing should be 12 inches at the finish line or climbing with rpm. The minute you see that vacuum go down, that means you've blown by the rings, and that's when you get into the danger zone.

"The other factor that is really important is reading spark plugs," continued Musi. "You have got to know how to look at the spark plug strap and check your timing. If you ever see a little bit of wear on the end of the electrode, you are definitely in the danger zone."

Nitrous is easy, simple, inexpensive horsepower, and it's relatively foolproof if it's done with proven methods. Sure, there's a lot of science involved in how nitrous oxide works. But adding it to an existing engine isn't difficult. The magic is well within the reach of average racers. "It should never take a year or two years of people never getting their nitrous combination together," said Wrenn. "It's simple." PRI

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GET A

NEW RACE TRACK SURFACING TECHNOLOGIES AND A SPECIALIZED APPROACH TO THE NEEDS OF DIFFERENT MOTORSPORTS DISCIPLINES IS HELPING TO TOPPLE ESTABLISHED RECORDS, ENHANCE THE FAN EXPERIENCE, AND IMPROVE THE BOTTOM LINE FOR RACE ORGANIZERS.

By Bradley Iger

GRIP

Whether you're going 11/10ths on a circuit or just headed to the grocery store, surface quality plays a role in just about every stint behind the wheel. Paved roads have existed in the United States for well over a century, and while it might be easy to assume that there's not much to them from a design standpoint, there's actually a stunning amount of application-specific science that plays into today's surface constructions.

To create track surfaces that provide motorsports-quality grip as well as the durability to handle the abuses of competition year after year, builders must take a range of factors into account. Everything from the types of cars that will use the surface and the annual climate in the region to the characteristics of the rocks that are sourced from their local quarries play a role in the process before a single foot of pavement is applied. As a result, the most esteemed race tracks use a surface that's truly bespoke to their needs.

FAST AND MADE TO LAST

Frederico Bastos of Phoenix Industries in Prescott Valley, Arizona, explained that while there's some obvious commonality between the desired traits of a typical roadway surface and a race track surface, an ideal version of the latter requires some unique attributes.

"You want the asphalt to be smooth and not tracking or

A racing series' track use requirements affect track surface design, said Cedric Burkhardt of Topcon Positioning Systems. "With a Formula 1 circuit [such as Britain's Silverstone race course, shown here], delivering the maximum amount of grip available from the car is a priority. The surface on an FIA Grade 1 race circuit is often a little bit different than on tracks used by IndyCar, IMSA, or even NASCAR."

segregating—those are things that we look for even when we're driving down our streets and highways," Bastos explained. "But in racing you have higher speeds involved, so any imperfections on the track surface will be exacerbated when you drive over them, especially if you're in a lighter car or on a motorcycle. And you want an asphalt that protects the surface from the natural stresses that can come up from the ground underneath it as well as the stresses that are being applied to the top of the track surface. On a typical public road, your biggest concern is usually weight caused by traffic loads. But on a track, you have a relatively small number of vehicles traveling on it at a given time, and they're very light. There, your bigger concern is more about lateral stresses—the sheer forces from high-grip tires that are exerting a lot of torque on that surface."

Cedric Burkhardt of Topcon Positioning Systems in Livermore, California, pointed out that the requirements of the racing series that use the track can also come into play in surface design. "For example, with a Formula 1 circuit, delivering the maximum amount of grip available from the car is a priority, so the surface you'll see on an FIA Grade 1 race circuit is often a little bit different than on tracks used by IndyCar, IMSA, or even NASCAR. For instance, at the Rolex 24, you'll see the back end of the cars will come out of line as they're exiting the Horseshoe, and that really just comes down to the grip available from that surface."

Those changes in grip can make the racing more exciting for the fans, but Burkhardt noted that durability also plays heavily into the design of a track surface. "If you're an F1 track, you might have the capital to repave your track every five years if need be, but that might not be something other types of tracks want to do," he said.

While the surfaces at most road courses and oval tracks have been designed to last significantly longer than that, a range of different factors can affect their longevity. "Since Daytona and Sebring are based in Florida, they're not dealing with the same climate conditions that a track like Road America up in Wisconsin has, where the winter months are more abusive to the surface. The friendlier the climate is, the longer the track surface will stay intact," Burkhardt added.

While weight from traffic loads is a concern on public roadways, the bigger concern on a race track "is more about lateral stresses—the sheer forces from high-grip tires that are exerting a lot of torque on that surface," said Frederico Bastos of Phoenix Industries.

And as Bastos noted, the geographical location of a track plays a fundamental role in the surface design on several different levels. "The asphalt needs to exhibit the right adhesive properties to keep the aggregate—and other elements that make up the surface—glued together, and it also needs to have the proper flexibility," he explained. "Flexibility is what's going to allow the asphalt to withstand those stresses without cracking, which can allow water and other contaminants to get in and accelerate the deterioration of the asphalt. Getting the ideal amount of adhesion and flexibility comes down, in part, to the asphalt oil content in the mixture, and the type of rock that's being used is a significant factor in determining what that should be. You're getting rocks from a quarry that's probably within a 60-mile radius of the facility when you start a project, and those rocks are the heaviest component used in the process, so you don't want to truck that material in from very far away. So, the type of rock that's available locally ends up being an important factor in that mix design."

"THE SUBGRADE AND SUBBASE ARE JUST AS IMPORTANT AS WHAT'S ON TOP."

Track location plays into the mix design for other reasons as well. "At Atlanta Motor Speedway, the surface is designed to be porous—water drains through the track surface instead of going over the surface to drain," Burkhardt said. "That leaves little holes in the surface, which cause more abrasion on the tires, but those holes also allow water to be drained away from the racing surface quicker and more effectively than it would be without it. That potentially means shorter—and fewer—rain delays."

The modifier used in the asphalt mixture can also have a significant effect on the track surface. Phoenix Industries handled the repaving process of Buttonwillow Raceway Park (BRP) back in 2014, and the mixture

that it used for that project included a rubber modifier in the asphalt. Bastos told us that this rubber modifier is particularly beneficial in race track applications. "It can give you the flexibility and adhesiveness that you want, and it undergoes a chemical reaction with the asphalt oil that helps to protect it from deteriorating," he said. "All factors being equal, this should roughly double the life expectancy of a track surface versus regular asphalt."

Bastos said that Buttonwillow was the first track in the country to use Phoenix Industries' rubber modifier in the resurfacing process of its track. The company will also construct the surface of a new, 2.5-mile road course that's being added to the facility this year.

BRP President Les Phillips said that the unique asphalt mixture not only enhanced the surface's longevity, it also improved on-track performance. "Every class immediately reported faster lap times. We have many SRF cars that race here, and they reported two-second improvements. That's typical of what we saw across the board."

BUILDING FOR STRAIGHT-LINE SPEED

While the construction of any track surface is essentially purpose-built for the reasons mentioned above, drag strip track surface design is truly an animal all its own. "Asphalt's fine for half-track or farther down, but concrete is really the way to go for a drag strip launch surface," said Kurt Johnson of Total Venue Concepts, Petersburg, Indiana. "The surface needs to be as flat as possible, and it has to have enough texture in it to grip rubber."

Johnson said that while most drag strips are repaved every 15 to 20 years, regular maintenance is crucial to keep the track not only fast and consistent, but safe. "As the surface degrades over time, it loses the ability for rubber to stick to it, and any time you take away surface area on the tire, you're creating a safety issue. But we can go in every five to eight years or so and do a grind process that cuts the strip flat."

"AS THE SURFACE DEGRADES OVER TIME, IT LOSES THE ABILITY FOR RUBBER TO STICK TO IT, AND ANY TIME YOU TAKE AWAY SURFACE AREA ON THE TIRE, YOU'RE CREATING A SAFETY ISSUE."

He said that some folks are concerned about the aggregate, but advances in the technology used in this process has

progressed significantly in recent years. "The big grinder leaves the track looking like corduroy, and you've got to get that out, so we use large floor grinders to remove those ringlets," Johnson explained. "Companies used to use carbide tips to do that, and they weren't hard enough to cut most aggregate, so you'd end up with an adhesion problem once you showed the aggregate. But now we're using diamonds to finish the surface and put texture in it, and we can use one that's specific to the geographic location that allows us to cut that particular type of rock."

"ASPHALT'S FINE FOR HALF-TRACK OR FARTHER DOWN, BUT CONCRETE IS REALLY THE WAY TO GO FOR A DRAG STRIP LAUNCH SURFACE."

The concrete surface is only one piece of the drag strip puzzle. "The subgrade and subbase are just as important as what's on top," he continued. "Concrete and asphalt are porous, and we've got to be able to get the water away from the racing surface from underneath, or else it'll wick right through and rubber will never adhere to it." As a result, a properly designed drag strip will be raised up higher than the surrounding area, and the surface mixture will employ the use of aggregates in the subbase that allow for water to flow away from the racing surface without compromising the high compaction needed in order to prevent the drag strip from physically shifting around.

As with road course and circle track surfaces, fluctuations in temperature cause the drag strip surface to expand and contract. Since more than one type of surface material is often involved in the construction of a drag strip, Johnson said it's crucial to design the track with that in mind. "Expansion joints are very important, and we typically don't see enough of them put into race tracks. If you don't have a big expansion joint wherever the concrete meets with the asphalt, you're going to get a bump in the surface because the asphalt expands at a much higher rate."

Since consistency plays such a key role in competitive drag racing, the mechanical grip offered by a drag strip surface is also an important factor in its overall quality. That's where top-layer treatments and traction compounds start to come into play. "Powdered resin can help with adhesion to the substrate before the traction compound glue is applied," said Brian Parish of Rocket Track Products, Ostrander, Ohio. "And that can improve the glue's longevity. But regular maintenance is always required to keep the track in good working order. While you want some amount of rubber on the track, too much of it will cause the surface to get soft, and the glue will get gummy as a result."

He added that, even on a well-maintained track surface, the type of traction compound used and how it's applied can have a significant effect on the quality of the racing. "Some tracks might want something that's just ready to use straight out of the drum, while others want a concentrated solution so that they can adjust the mixture on their end—they know the track really well, and they know how it's going to react to changes in the mixture. They might want to make adjustments based on the weather that day or the event that's running, and that allows them to get the best surface that they can," explained Parish.

RETURN ON INVESTMENT

Paving a track is a costly endeavor regardless of the approach, and that can lead to deferred maintenance or just generally shoddy track conditions.

The surface of a drag strip's launch area "needs to be as flat as possible, and it has to have enough texture in it to grip rubber," said Total Venue Concepts' Kurt Johnson.

The type of traction compound used and how it's applied can have a significant effect on the quality of the racing. Some tracks may apply a compound that's ready to use straight out of the drum, while others may want to adjust the mixture to suit ambient conditions or the cars running in the event.

But beyond addressing potential safety concerns, a good track surface ensures that teams can perform at their best.

"In downforce cars and other cars that rely on a floor to produce grip, the lower we can run the car, the more efficiently it will work," said Indy NXT series driver James Roe. "A smooth track allows the car to really come alive because we can run it a lot lower than we can at a track that's in rough condition, and it also creates less mechanical wear and tear on components like springs and dampers. Everyone loves a repaved race track; we've got several tracks on the race calendar this year that have recently been repaved, or are currently in the process of being repaved, and they're the talk of the town because we know that new lap records are coming."

And that can make a track more attractive to racers who are looking to make history as well as those who are eager to witness it.

"It brings the performance of your race track to the cutting edge of the existing envelope," said Johnson. "That allows racers to run those record numbers, and that's what the fans want to see." PRI

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MEMBER CHECK-IN

MICKEY THOMPSON TIRES & WHEELS

This legendary brand is fighting to keep innovation alive by denouncing overregulation while simultaneously continuing its long-standing partnerships throughout the racing community.

By Jim Donnelly

"At Mickey Thompson Tires & Wheels, we recognize the impact our founders and company have had at the roots of American racing," said Heather Tausch. "We recognize PRI as an important resource for this community and see it as our duty to support its efforts in improving the health of our industry."

Stripped to its basics, the notion is that too many people outside the world of motorsports are trying to determine how the industry should be run, not always with the best level of knowledge. While expressing enthusiasm for the future of the racing business, very much in keeping with the company co-founder's undying optimism and unstoppable energy, Mickey Thompson Tires & Wheels in Stow, Ohio, believes the world of motorsports is better off when outsiders aren't trying to cramp it with overzealous regulation and oversight.

"Overregulation of motorsports is a concern that affects our entire industry and has far-reaching consequences, even in tires and wheels," Senior Marketing Director Heather Tausch said. "Many innovations that automotive manufacturers rely on today began at the race track. Aluminum-alloy wheels found on most cars today was technology first deployed by Bugatti in its Type 35 race car in 1924. Even today, much of the technology found in Mickey Thompson's on-road tires was developed using insight from off-road racing, rock crawling, drag racing, and more. Limiting the ability for racers and enthusiasts to enter into motorsports through stricter regulations will ultimately stifle innovation within the entire automotive space."

One can almost hear the voice of the company's late co-founder, one of the true immortals in the universe of American speed. Mickey Thompson was a pioneering innovator in dragster design, the construction of land speed record cars, and the operation of drag strips when he and Goodyear chief designer Gene McMannis teamed up in 1963 to create Mickey Thompson Tires & Wheels, with the intention of developing highly specialized wheel-and-tire combinations for Thompson's constantly evolving racing needs. Thompson was already the first driver to exceed 400 mph in a wheel-driven vehicle when he branched out to establish SCORE, the off-road racing sanctioning organization, and to essentially invent the sport of stadium off-roading, a clear predecessor to today's global rallycross action.

The new firm "allowed the rest of the racing community to also access the fruits of this partnership: the latest tire innovations developed through a partnership with highly skilled racers in demanding real-world

Among the new M/T products to come in 2023 are 42- and 44-inch tire sizes in the Baja Boss line to provide racers additional ground clearance, sidewall flex, and traction for off-road racing's extreme conditions.

Founder Mickey Thompson was already a pioneering drag and land speed racer when he created his namesake tire and wheel company in 1963. The new firm allowed the rest of the racing community to benefit from the tire innovations he developed through a partnership with racers in demanding real-world environments.

environments," Tausch said, adding that this principle is "a core tenet of the company that continues to this day."

M/T, as it's commonly known for short, is in the business of producing specialty tires, largely for off-road applications, although M/T also produces and markets full lines of drag tires, tires for street performance vehicles, and an array of custom wheels. For all the company's recent fame in the off-road world, M/T has a broad product array and a thick catalog of offerings, which Tausch said must constantly be managed amid strong demand that's been a fixed part of M/T's recent history.

"As many performance companies will tell you, the past several years have been a time of increasing demand and growth within our industry," she said. "While we welcome the increased demand for our products, we have had to prioritize manufacturing differently and reorganize our catalog to meet the needs of our customers. We remain committed to delivering a superior product to meet these needs."

That initiative, going forward, focuses on new lines of products that M/T plans to bring online in the coming year. "Mickey Thompson works closely with racers and enthusiasts to innovate and develop technology based on extreme real-world situations," Tausch said. "One of our most exciting initiatives to come in 2023 will be the availability of our Baja Boss M/T tires in 42-inch sizes for 17-inch and 20-inch wheels, and a 44-inch tire for 20-inch wheels. This development came from working closely with an extensive network of off-road enthusiasts and race teams and was designed to allow them the additional ground clearance, sidewall flex, and traction needed to push the limits off-road.

"Additionally, with the increased cost of glue and other supply-chain issues leading to disruptions in track prep and maintenance throughout the drag race community, Mickey Thompson is excited to announce three new ET Drag tires based on our popular 28/10.5-15 size lineup, with compounds better suited to these variable track conditions," she continued. "These tires will allow racers to keep the traction performance they have come to expect from Mickey Thompson even in unpredictable track situations."

Ensuring that the motorsports industry remains vibrant, even in the face of ongoing regulatory efforts, is why Mickey Thompson enjoys its status as a PRI Founding Member. The advocacy that PRI represents to the racing parts industry is vital in today's environment, Tausch said.

"At Mickey Thompson, we recognize the impact our founders and company have had at the roots of American racing," Tausch explained. "Even today, our innovation and reputation are derived from having a close relationship with the motorsports community. We recognize PRI as an important resource for this community and see it as our duty to support its efforts in improving the health of our industry. We believe our history and reputation mean something to our community and are proud to add our voice to supporting PRI." PRI

PRI TECH

CENTRIFUGAL SUPERCHARGER SETUP

Horsepower goals, engine size, and type of driving are just some of the factors to consider when choosing one of the most popular power adders—a centrifugal supercharger.

By Brian Cox

We all know superchargers provide additional power and performance by supplying more air—or "compressed," denser air—to the engine. In fact, they are the power adder of choice for countless competitors and enthusiasts across the racing spectrum.

Among their primary benefits is ease of installation, i.e., relatively simple intake and discharge ductwork compared to other power adders.

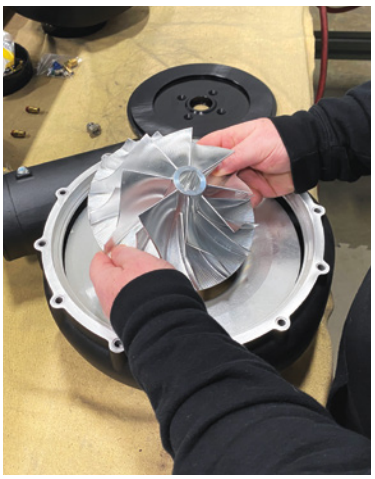
There are also multiple types to choose from, including Roots, twin-screw, and centrifugal. For this piece, however, we'll focus on the latter.

Centrifugal superchargers, also known as compressors or blowers, are belt-driven, or in race applications, direct gear driven units powered by the engine's crankshaft. Supported by brackets, they can be mounted in multiple locations across the engine compartment.

This design element means the unit doesn't have to sit directly on top of the engine, which in turn helps minimize under-hood temperatures, as well as compressor discharge temps. It also doesn't require you to re-configure or replace the engine's intake manifold, which has gone through the timely process of OEM-level R&D to determine the designated runner length.

Centrifugal superchargers have a variety of different gear case options depending on the application, including:

- Configurations according to street or race engine heads
- Standard or heavy-duty bearings



- Compressor stages (impeller and volute sizes)

Thus, it is important to choose the right supercharger head unit for a vehicle's engine size, horsepower goals, and type of driving. Let's examine a few of these factors in more detail.

PURSUING HP GOALS (NOT 'BOOST' OR 'PSI' NUMBERS)

Consider that boost is a measurement of airflow restriction or backpressure at the intake manifold. Aftermarket products like high flow heads, headers, cams, or intakes will have different boost outcome numbers associated with the same supercharger. Thus, it is unwise to use boost targets as a determining factor in deciding which blower unit is right for the application.

By zeroing in on a horsepower-based goal instead, you can build your current engine—or select another one—to achieve those goals in conjunction with the properly sized supercharger head unit.

Bigger is not always better when selecting a centrifugal supercharger. A supercharger that is too big for the engine will deliver too much air, causing boost lag at low rpm.

For reference, street supercharger head units typically support "up to" a set range of horsepower levels. These ranges tend to follow certain increments:

- 525
- 775
- 950
- 1,000

Race supercharger head units, on the other hand, support "up to" horsepower increments in the following:

- 1,200
- 1,400
- 1,500
- 1,600
- 1,700
- 2,000
- 3,500

Consider: most engine builds' inevitable fate is gradually increasing horsepower. Thus, it is wise to consider both future and current power goals when selecting a centrifugal supercharger.

Centrifugal superchargers have a variety of different gear case options depending on the application. Choices can be determined by several factors, including the cylinder heads, the bearings in the case (standard or heavy-duty), and the compressor stages.

USING DISPLACEMENT TO SELECT BLOWER SIZE

In general terms, a supercharger that is too big for the engine will deliver an overabundance of air and cause boost lag at low rpm. Conversely, one that is too small won't be able to supply enough air for the engine to run efficiently and will nose over at higher rpm.

For optimal performance, a supercharger's impeller speed must be within a certain rpm range. This range is dependent on the supercharger's size, the engine's size (in cubic inches), and the engine's power level. When a blower is appropriately matched to the engine, its benefits include lower discharge temperatures, increased air charge density, and extended unit longevity.

ENGINE BUILD LEVELS (FORGED INTERNALS VS. STOCK INTERNALS)

Many of today's modern engines are capable of making more power than when they came from the factory. Models such as the Chevy LS, Dodge HEMI, or Ford Coyote can support a decent amount of additional horsepower—typically up to a 40–50% increase in horsepower—before requiring internal upgrades.

Most supercharger manufacturers offer 50-state CARB-legal supercharger kits that stay within these 40–50% incremental horsepower boundaries, providing a safe and long-lasting product.

Older engines can certainly benefit from upgraded forged internals to avoid potential engine failures. But like anything performance-related, it's all based on matching the intended horsepower goal to the application.

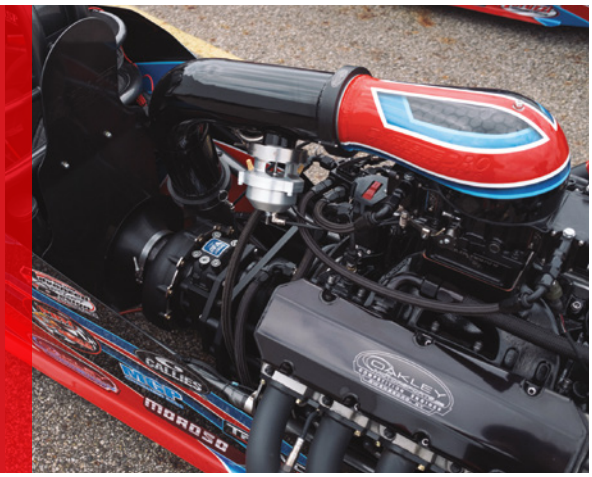
SUPERCHARGER PULLEY SIZE CHANGES' EFFECTS ON BOOST & HP

These can vary by application, but for every .10-inch you go down in supercharger unit pulley size, you gain about 1 lb. psi/boost. Conversely, for every .10-inch you go up in supercharger unit pulley size, you lose about 1 lb. psi/boost. Typically, you will have a starting baseline reference from the stock supercharger pulley that came with the kit. There will always be sizing differences depending on the application.

Consider that when changing either the supercharger pulley or crank pulley, you must be careful not to overspin the blower's max rpm limit. This can be determined by using an impeller speed calculator and plugging in various pulley sizes and shift max rpm's. For those savvy with numbers, we provide the relevant formula below:

Crank Pulley Size x Max rpm x Blower Step up Ratio / Supercharger Pulley Size = Impeller Speed

Further information can usually be found on a manufacturer's website.



Centrifugal superchargers are driven by the engine's crankshaft, but unlike other kinds of superchargers, they can be mounted in multiple locations, not just on top of the engine. This minimizes compressor discharge temperatures as well as underhood temperatures (in race cars that have an enclosed engine bay).

ENGINE OIL FED VS. SELF-LUBRICATED

Most street and street/strip centrifugal supercharger head units are offered in both engine oil-fed and self-lubricated variants. Race-specific supercharger head units are only offered as engine oil-fed units.

Engine oil-fed units are required for serious drag racing, road/track racing, drifting, or any other type of driving that subjects the car to high G-force levels. One notable benefit of oil-fed is the existence of an oil feed line injector that squirts oil directly onto the unit's gears for constant lubrication. This method helps keep the supercharger bearings and gears consistently at a cooler temperature.

Self-lubricated units are great for most vehicles where street driving or milder street/strip or sport touring is the intended use. Supercharger head units that are self-lubricated also have a simpler/easier installation, as there are no oil feed or drain lines to run.

STRAIGHT-CUT (LOUD) GEARS VS. HELICAL-CUT (QUIET) GEARS

There are two options for gear sets in centrifugal superchargers gearcases. The first are straight-cut, also known as "loud" gears, whose design results in greater friction (thereby making more noise) across the gear mating surfaces. By contrast, helical-cut gears are labeled as "quiet" gears, as their layout utilizes a helical curvature to mesh gears more seamlessly.

There really is no performance advantage or disadvantage to using one or the other—it's more a preference on the overall sound the supercharger makes. Some supercharged vehicle owners prefer a quieter operating unit; others want the inherent mechanical sounds of the gears to be louder.

ALWAYS CONSULT THE PROFESSIONALS

While the above provides general knowledge and helps explain some of the options and distinctions between different centrifugal superchargers, vehicle owners planning a build should consult an experienced, reputable engine builder, installation shop, tuner, and perhaps most importantly, their supercharger manufacturer, as these resources can help prevent mistakes while offering guidance on the right parts for the vehicle and engine combination—the first time. PRI

Brian Cox is a marketing manager at Vortech & Paxton Superchargers in Channel Islands, California, and has been in the automotive industry for more than 25 years. Starting at Hot Rod magazine and Petersen Publishing in 1997, he has been involved in most facets of the aftermarket industry, including sales, publishing, PR, editorial, and marketing. His lifelong hobbies include dirt bikes, off-roading/4x4s, and muscle cars.

ADVOCACY CORNER

Tracking legal, legislative, and regulatory developments impacting the racing and performance industry.

Edited by Laura Pitts

PRI's Washington, DC-based legal and advocacy teams work continuously to protect and support motorsports venues, sanctioning bodies, and businesses around the nation. We are tracking several initiatives this month, including new legislation designed to prevent internal combustion engine (ICE) bans across the nation, a new law designed to help race tracks in West Virginia, and more.

BILL INTRODUCED IN CONGRESS THAT WOULD PREVENT ICE BANS

US Representative John Joyce (R-PA) has introduced H.R. 1435, the "Preserving Choice in Vehicle Purchases Act," a bill designed to protect Americans' right to choose the technology that powers their cars. The bill—which was introduced in response to the California Air Resources Board's (CARB) plans to ban the sale of new internal combustion engine (ICE) vehicles by 2035—would restrict the US Environmental Protection Agency (EPA) from issuing a waiver for regulations that would ban the sale or use of new vehicles with ICE. If enacted into law, this bill would stop CARB's plans to ban ICE vehicles, which requires the EPA to waive federal preemption provisions in the Clean Air Act for California's zero-emissions vehicle (ZEV) mandate to take effect.

"While electric vehicle (EV) technology has its place in motorsports, so does the internal combustion engine. PRI will continue to advocate on behalf of the industry that has helped make ICE vehicles a reliable, affordable, and clean option for millions," said Eric Snyder, PRI/SEMA Senior Director, Federal Government Affairs.

It is critically important that the EPA does not permit CARB's ZEV regulations, as they could lead to 17 other states that have followed all or part of California's previous clean-car rules to adopt similar proposals. California requires 35% of new cars, SUVs and small trucks sold to be zero-emissions starting in 2026, increasing to 68% in 2030, and 100% in 2035.

We need your help. Voice your support for allowing the American people to determine the technology that powers their vehicles instead of government officials by sending a pre-written letter to your US Representative, which can be found at **sema.org/vehicle-choice**. For more information, contact Snyder at erics@sema.org.

MULTIPLE STATES PLEDGE TO SUPPORT ICE SALES

Motorsports members and performance enthusiasts across the nation may soon have something to celebrate. Colorado officials have finalized the state's draft 2023 Colorado Electric Vehicle (EV) Plan, which, once approved, will permit the sale of new internal combustion engine-powered vehicles—a surprising move in the California Air Resources Board-following state. The state is expected to formally adopt the draft later this year.

Similarly, the New Hampshire House of Representatives recently voted to defeat a PRI- and SEMA-opposed bill that would have required the Granite State to adopt California's low- and zero-emissions vehicle standards and ban the sale of new gas- and diesel-powered cars starting in 2035.

Lawmakers in both Iowa and Texas, meanwhile, have introduced PRI-supported legislation to ensure consumer choice of vehicle powerplants and fuel. The bills would prevent a county or city from limiting access to certain types of power sources. Under current law in both states, sales of new gas- and diesel-powered vehicles may be threatened if narrow energy policies are adopted. To contact Iowa lawmakers in support of the bill, visit **https://p2a.co/3onxsPK**. Texas lawmakers may be contacted at **https://p2a.co/6xVzCqm**.

"We believe racers and race teams, not the government, should be allowed to choose the type of vehicle technology that best serves them at the race track," said Christian Robinson, PRI/SEMA Senior Director, State Government Affairs & Grassroots. For more information, contact Robinson at christianr@sema.org.

SUPPORT NEEDED FOR PRI-OPPOSED LEGISLATION IN RHODE ISLAND

Lawmakers in Rhode Island have introduced PRI-opposed legislation (H. 6055) which would adopt California's low- and zero-emission standards and ban the sale of new gas- and diesel-powered motor vehicles starting in 2035.

We need your help to contact lawmakers and request their opposition to this bill. Send a pre-written letter in a few clicks by visiting **https://p2a.co/L9ArnSC**.

PRO-MOTORSPORTS LEGISLATION SIGNED INTO LAW

After representatives from PRI and SEMA and motorsports community members recently traveled to Charleston, West Virginia, to raise awareness for pro-

motorsports legislation, West Virginia Governor Jim Justice signed into law PRI-supported legislation to establish the Motorsport Responsibility Act. The new law defines areas of responsibility and assumed risks by participants for recreational and commercial motorsports facilities.

The Act will reduce liability insurance premiums and allow racing venues to invest the savings—for example, for promotional purposes, and will increase tourism and create more jobs in the state.

OKLAHOMA REPUBLICAN NAMED CO-CHAIR OF MOTORSPORTS CAUCUS

US Senator Markwayne Mullin (R-OK) has been named co-chair of the Congressional Automotive Performance and Motorsports Caucus. Sen. Mullin, a former competitive rock crawler and car collector, is a longtime advocate for racing and motorsports parts businesses.

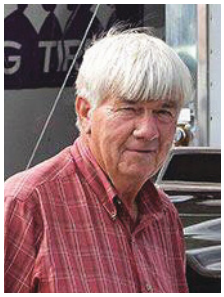
Sen. Mullin joins Sen. Jon Tester (D-MT) and US Reps. Bill Posey (R-FL) and Sanford Bishop (D-GA) as co-chairs of the Caucus, which includes 14 senators and 45 House members. By raising the industry's profile on Capitol Hill and in the eyes of the public, the PRI- and SEMA-supported honorary caucus recognizes the critical roles racing and vehicle modification play in the lives of millions of Americans.

PRI TRACK AMBASSADOR RAISES AWARENESS OF PROMOTER HELPLINE

PRI track ambassador Tom Deery continues to attend industry events—including promoter meetings in Michigan and Wisconsin—to bring awareness to PRI's advocacy efforts, with a focus on the Race Track Promoter Helpline available to track owners, operators, promoters, sanctioning body officials, and related motorsports professionals. Industry members can contact 202-847-6593 and PRILegalHotline@performanceracing.com for access to relevant legal resources, peer-to-peer discussions, grassroots campaigns, lawyer referrals, and more. PRI

INDUSTRY NEWS

LONGTIME BEECH BEND TRACK OWNER DALLAS JONES, 82



Dallas Jones

Dallas Jones, the longtime owner of Beech Bend Raceway Park in Bowling Green, Kentucky, has passed away. He was 82.

Jones and his wife Alfreda purchased the famed drag racing facility in 1984 before later buying an amusement park and campgrounds on the adjoining property. Jones was inducted into the Kentucky Motorsports Hall of Fame in 2015.

DODGE UNVEILS 2023 CHALLENGER SRT DEMON 170

Dodge has introduced the 1,025 horsepower 2023 Dodge Challenger SRT Demon 170, the automaker's seventh and final "Last Call" special-edition model.

2023 Dodge Challenger SRT Demon 170

With a 945 lbs.-ft. (at 4,200 rpm) production HEMI engine, the SRT Demon 170 is designed to reach 60 mph in 1.66 seconds and features the highest G-force acceleration of any production car at 2.004 Gs.

CHEVROLET TO RETIRE CAMARO AFTER SIXTH GENERATION

After nine model years in the market, the sixth-generation Chevrolet Camaro will retire after the model year 2024. The street-legal track Camaro, the 650 horsepower ZL1 1LE, produced the fastest time for any Camaro at the company's Milford Proving Ground in Michigan, according to automaker sources.

Chevrolet, which campaigns the sixth-generation Camaro in NASCAR, IMSA, SRO, NHRA, and the Supercars Championship in Australia, will continue to compete on the track.

TOYOTA, TRD LAUNCH GR SUPRA JR. ROADSTER FOR NHRA RACING

Toyota and Toyota Racing Development (TRD, U.S.A.) have unveiled the first-of-its-kind GR Supra Jr. Roadster set for National Hot Rod Association (NHRA) competition. In addition, NHRA will establish a new Jr. Roadster class for the NHRA Summit Racing Jr. Drag Racing League, although a launch date has yet to be set.

Toyota and TRD U.S.A. worked with Half Scale Dragsters Incorporated and Antron Brown, who fields Jr. Dragsters with his family, to create the new vehicle.

POLARIS UNVEILS RZR PRO R FACTORY RACE-READY UTV

Polaris Off Road in Minneapolis, Minnesota, has unveiled a purpose-built UTV called RZR Pro R Factory. Based on its RZR Pro R platform, the race-ready model is engineered for the demands of desert racing.

Four Pro R Factory vehicles have been developed for the Polaris Factory Racing team.

NEW DETAILS ON THE FUTURE OF AUTO CLUB SPEEDWAY (CA)

Additional details have been revealed on the recent sale of NASCAR's Auto Club Speedway—the 2-mile, low-banked D-shaped oval superspeedway in Fontana, California. It was previously reported that NASCAR had sold 433 acres of the 522-acre site.

Now, officials are stating the famed track was purchased for an estimated $559 million by Hillwood Development, owned by real estate mogul Ross Perot Jr. He plans to build a 6.6-million-square-foot logistics hub called "Speedway Commerce Center," according to published reports.

NASCAR still plans to build a new short track on the remaining acreage, better suited for the Next Gen cars, according to recent reports.

SOUTH BOSTON SPEEDWAY (VA) EXPLORING OPTIONS TO SELL

South Boston Speedway—the 4/10-mile asphalt oval in South Boston, Virginia—has confirmed that its owners are exploring options to sell the venue.

"The Mattioli family is determined [to sell the speedway to someone who will] keep the rich history and tradition of first-class short track racing alive in Halifax County," said a track representative. The 2023 schedule, which runs through Championship Night in September and a CARS Tour special in October, remained unchanged at press time.

FASTRAK, ULTIMATE SERIES SOLD TO BILL AND STACY LUPINOS

Stan Lester—the founder of the FASTRAK Racing Series and the ULTIMATE Super Late Model Series—has sold both Carnesville, Georgia-based series to Bill and Stacy Lupinos. Bill, currently the FASTRAK vice president, also owns and operates FASTRAK's Heart of America USLMS (ULTIMATE HoA) and Richmond Speedway in Richmond, Kentucky, with his wife, Stacy.

"This is probably the hardest thing I've ever done," said Lester. "I want to express to the racing community how much I appreciate being a part of the industry."

NEW OWNERS FOR TICK PERFORMANCE IN NORTH CAROLINA

Tick Performance—the performance parts manufacturer based in Mount Airy, North Carolina—has been purchased by Joey Anderson and Matt Goins. The pair take over operations from Jonathan Atkins, son of founder Johnny Atkins.

Goins is the company's lead product engineer, while Anderson holds marketing duties, helping to create the company's first e-commerce site, among other roles.

CUMMINS ANNOUNCES ACCELERA GREEN-TECH POWER BUSINESS

Cummins—the Columbus, Indiana-based specialist in diesel and alternative fuel engines, generators, and related components—has launched Accelera by Cummins, a new brand for its New Power business unit. With operations in North America, Europe, and

China, and additional joint ventures in the Netherlands and China, Accelera will focus on a range of zero-emissions solutions, including hydrogen fuel cells, batteries, e-axles, traction systems, and electrolyzers.

Amy Davis will serve as Accelera president.

"Achieving our goal of reaching net-zero emissions by 2050 requires leveraging our entire portfolio of businesses," said Jennifer Rumsey, Cummins president and CEO.

TORRES FAMILY TAKES OVER SOUTH GEORGIA MOTORSPORTS PARK

South Georgia Motorsports Park (SGMP), the drag racing facility in Adel, Georgia, has been sold to Raul and Jennifer Torres. The 1/4-mile drag strip was previously owned by Ozzy and Maria Moya, who purchased the track in 2015. The Moyas will continue to run Orlando Speed World in Orlando, Florida.

SGMP is known for its Duck X Productions events including Battle of the Thrones (set for October 9–11) and No Mercy (October 12–15).

MEYER DISTRIBUTING ANNOUNCES NEW MARYLAND CROSS-DOCK

Jasper, Indiana-based Meyer Distributing has announced the addition of its Hanover, Maryland, cross-dock. The facility will have a direct feed from Meyer's Pennsylvania distribution hub.

"We are investing heavily in the Northeast as our focal point for 2023," said Jeff Braun, CEO of Meyer Distributing.

HYPERCRAFT NAMES KIRK MILLER VP OF DIRECT SALES

Hypercraft—the Provo, Utah-based provider of electric motor manufacturing and turnkey EV drive systems—has named Kirk Miller as the company's new vice president of Direct Sales.

In this role, Miller will help serve the EV marketplace across multiple applications in "an effort to break down barriers to EV manufacturing," according to a company statement.

Miller arrives at Hypercraft from AEM Electronics, where he spent the previous 24 years as vice president of Sales and Marketing.

FORMULA 1 SECURES AUSTRIAN GRAND PRIX THROUGH 2027

Formula 1 officials have announced a new four-year agreement to race in Austria until 2027.

This year's race, set for June 30–July 2, will celebrate the 10th anniversary of the Austrian Grand Prix's return to the Formula 1 calendar and feature an F1 Sprint for the second consecutive year.

POWER AUTOMEDIA ANNOUNCES STAFF UPDATES

Power Automedia—the media and automotive digital publishing company based in Temecula, California—has hired Andy Bolig as the new editor of Chevy Hardcore magazine.

Andy's brother, Randy Bolig, previously managed Chevy Hardcore for seven years. Randy has since been promoted to run the company's diesel-centric magazine, Diesel Army.

LUBRICATION SPECIALTIES ANNOUNCES ADDITIONS TO MARKETING TEAM

Lubrication Specialties (LSI)—the Mt. Gilead, Ohio-based manufacturer of Hot Shot's Secret (HSS) brand of additives, oils, and fluids—has announced the addition of Ben Haws as its new digital marketing manager and Chris Lane as Hot Shot's Secret's new field marketing representative.

Haws will develop strategies to build brand loyalty from new and returning users for multiple markets, among other duties, while Lane will help create programs and develop strategies to increase brand awareness at consumer and trade events.

AAM GROUP HIRES JEFF KESAR AS ENGINE PRO MARKETING SPECIALIST

After assuming operational oversight of Engine Pro, The AAM Group—the automotive aftermarket program distribution group and specialty marketing firm based in Piney Flats, Tennessee—has announced that Jeff Kesar will oversee Engine Pro's marketing and strategic planning.

NASA NAMES REPLACEMENT FOR RETIRING JERRY KUNZMAN

The National Auto Sport Association (NASA), based in Las Vegas, Nevada, has announced that co-founder and executive director, Jerry Kunzman, will retire this year. He will continue to serve as the regional director of NASA's Northern California region.

Jeremy Croiset, current COO, will replace Kunzman as CEO. NASA was founded by Kunzman and Ali Arsham in 1991.

Croiset joined the organization in 2005 to help manage sponsorship and marketing duties. In 2010, he was promoted to director of Business Development before being named vice president in 2018. In April 2020, he was named COO.

ALL STAR CIRCUIT OF CHAMPIONS NAMES KEVIN NOUSE SERIES DIRECTOR

Officials with the Brownsburg, Indiana-based Tezos All Star Circuit of Champions presented by Mobil 1 have announced that Kevin Nouse has been promoted to the position of series director.

Nouse is a sprint car racing veteran who joined All Star as a technical official in 2022, when he also served as a point of contact between the pit area and scoring tower. Nouse will maintain his responsibilities on the grounds before transitioning to the scoring tower in 2024.

In addition, longtime scorer and current operations director Ross Paulson will assume the race director role later this year.

NHRA NAMES MIKE EAMES NORTHWEST DIVISION DIRECTOR

Officials with the National Hot Rod Association (NHRA) based in San Dimas, California, have announced the addition of Mike Eames as division director of the Northwest Division, also known as Division 6. Eames will oversee NHRA member tracks in Alaska, Alberta (Canada), British

Columbia (Canada), Idaho, Montana, Oregon, and Washington.

Eames previously served as the general manager at Rocky Mountain Raceways (West Valley City, Utah) and as an announcer at NHRA divisional and national events.

IMSA HALL OF FAME UNVEILS INAUGURAL CLASS

Daytona Beach, Florida-based International Motor Sports Association (IMSA) has unveiled the inaugural class for the IMSA Hall of Fame. The four drivers include multiple-time IMSA champions Peter Gregg, Hurley Haywood, Al Holbert, and Scott Pruett. IMSA's three founders, John and Peggy Bishop and Bill France Sr., will also be inducted.

In addition, four iconic race cars—the Chevrolet Corvette C5-R, Ferrari 333 SP, Mazda RX-7 GTU, and the Porsche 962—have also been selected for enshrinement as part of October's WeatherTech Night of Champions.

IMS HALL OF FAME TO INDUCT TIM CINDRIC, TONY GEORGE

The Indianapolis Motor Speedway (IMS) Museum has announced its IMS Hall of Fame Class of 2023 inductees: Tim Cindric and Tony George. They will be formally celebrated at a ceremony on Friday, May 26, in Indiana.

WEST COAST STOCK CAR/ MOTORSPORTS HALL OF FAME NAMES FIVE NEW MEMBERS FOR 2023

NASCAR Cup Series champions Kurt Busch and Kevin Harvick head the West Coast Stock Car/Motorsports Hall of Fame's five-member Class of 2023. In addition, Matt Crafton (NASCAR Craftsman Truck Series), Brent Kaeding (sprint car champion), and Lyn St. James (IMSA champion and Women in Racing North America) will also be honored during an induction gala in June.

CANADIAN MOTORSPORT HALL OF FAME INDUCTS 13

The Canadian Motorsport Hall of Fame (CMHF), based in Toronto, Ontario, Canada, has inducted Bob MacDonald, Carl Harr, Chris Bye, Dave Lloyd, Derek Lynch, Dick Midgley, Gary Elliott, Robert Giannou, Russ Urlin, Scott Spencer, Terry Epp, and Uli Bieri into its Competitors/ Builders/Team Members/Significant Contributors category, which also includes AIM Autosport. In addition, Bruce Biegler has been inducted in the Media category.

IMCA ANNOUNCES COMPOSITE BODY PANEL MANDATE

Vinton, Iowa-based IMCA Racing has announced mandates for the composite body panels allowed in the Modified and Late Model divisions.

"We will use the United States Department of Transportation (DOT) FMVSS302 burn rate testing definition. We will continue to approve additional composite body panels as samples are submitted to us along with proof of burn rate testing," said Brett Root, president of IMCA. Officials are looking for panels made with strong, fire-resistant material.

Composite body panels submitted by Five Star Bodies/MD3 have already been determined to meet those parameters and are approved for use in both divisions. Root also announced plans to consider composite body panels in additional IMCA divisions in the future.

INDYCAR EXTENDS NTT, NTT DATA ENTITLEMENT PARTNERSHIP WITH MULTIYEAR AGREEMENT

Officials with Penske Entertainment's IndyCar have announced NTT and NTT DATA have extended the entitlement partnership of North America's premier open wheel motorsports series, the NTT IndyCar Series. NTT has served as the title sponsor since 2019.

The new multiyear agreement will also have NTT and NTT DATA continue as the Official Technology Partner for IndyCar, the NTT IndyCar Series, Indianapolis Motor Speedway (Indianapolis, Indiana), the Indianapolis 500, and the NASCAR Brickyard weekend at IMS.

For all the latest motorsports industry news, visit primag.com/industrynews.

RACE SHOP

BMR SUSPENSION
bmrsuspension.com

BMR tubular A-arm sets for 1978–1987 GM G-Body are manufactured from 1.25- and 1.5-inch DOM tubing and laser cut 3/16-inch mounting plates. Upper A-arms feature shorter tubes and offset cross-shafts. Lower A-arms feature a CNC-machined ball joint cup with additional clearance for late model brake kits.

Contact: 813-986-9302

CLASSIC PERFORMANCE PRODUCTS
classicperform.com

LS cast exhaust manifolds are designed for rear-steer applications such as the 1967–1969 Camaro, 1968–1974 Nova, and other GM LS-powered applications. These manifolds are designed with a center dump configuration, providing more space at the rear of the motor and firewall. The smooth round ports allow for better flow and increased horsepower.

Contact: 714-522-2500

DEATSCHWERKS
deatschwerks.com

This X2 Series dual pump module for 6th Generation Camaro and CTS-V3 features a billet top hat and billet center section mate with OE lower bucket to combine the best features of OE and aftermarket into a 1,000-horsepower fuel solution. A return plumbing kit is required and includes lines, fittings, regulator, filter, and pressure gauge.

Contact: 405-217-0701

ECUMASTER
ecumasterusa.com

The EMU Pro is a standalone engine management system that's made to provide flexibility, advanced features, and control for high-performance engines. Some key features include up to 16 peak/hold injector drivers and 12 ignition outputs, dual drive by wire and four variable cam control, direct injection support, advanced engine control algorithms, and much more.

Contact: 817-523-9947

JERRY BICKEL RACE CARS
jerrybickel.com

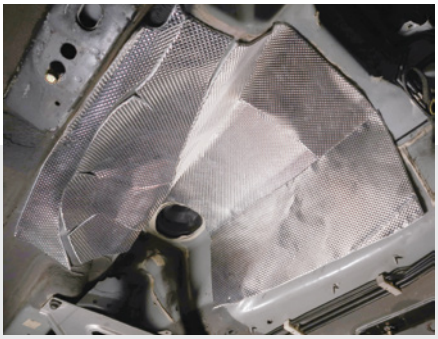
This steering wheel features a lightweight aluminum outer ring; 6061 aluminum center; three button mounting holes pre-drilled for the steering wheel button tab, allowing up to three per side; and 13-inch diameter. It is black anodized with a textured finish on the grip, weighs 0.9 pounds, and bolts directly to M/W and Strange five-bolt quick-release hubs.

Contact: 636-356-4727

JRi SHOCKS
jrishocks.com

This dual bleed piston is designed to eliminate the compromise of having to choose a single bleed for both directions. Its shorter piston height is made for better response and is compatible with all 1.75-inch bore JRi Shocks, including the double-adjustable shaft. The high-flow port design improves tire grip, and the bleed flow-path does not flow past a shim before it can bypass the piston.

Contact: 704-660-8346



DESIGN ENGINEERING INC.

designengineering.com

DEI's custom-designed transmission tunnel heat shields for 2006–2015 Mazda Miata NC models are made to reduce the heat entering the driver area from the transmission tunnel. This kit is a direct replacement for a factory heat shield. It's precision cut for a precise fit and easy installation and features a reflective and durable outer layer that can withstand temperatures up to 1,750°F.

Contact: 800-264-9472

MAHLE MOTORSPORT

mahlemotorsports.com

Big block Mopar PowerPak piston sets are made for the 383 and 400 B series and 440 RB series that are designed with oversized valve pockets to allow for bigger valves and performance camshafts. Pistons are made of high-strength 4032 alloy with a slipper skirt forging and are dual coated with MAHLE's GRAFAL skirt coating and Phosphate dry lubricant.

Contact: 888-255-1942

ROBINS™ SINCE 1983 - 0 + Exactly

Signature brand

Original

RUBI SURF

Heavy Duty Cylinder Head Surfacing Machines

Simple & Smart

Designing & Manufacturing Patented Technologies

US 17879818 | US 17892165 (Patents pending)

RUBI SURF 1.7 SPECIFICATIONS

X-axis workhead travel: 42 inches (1065 mm)
Cylinder head length: 34 inches (865 mm)
Cutter head diameter: 14.0 inches (356 mm)

RUBI SURF 1.9 SPECIFICATIONS

X-axis workhead travel: 56 inches (1400 mm)
Cylinder head length: 47 inches (1200 mm)
Cutter head diameter: 16.5 inches (420 mm)

COMMON SPECIFICATIONS

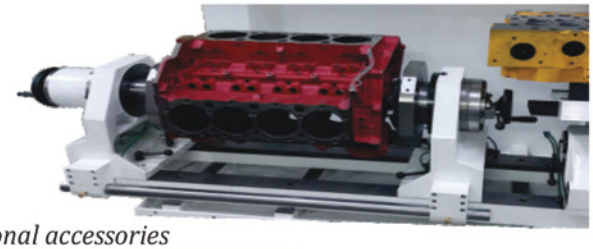
Spindle speed:	200-1200 RPM variable (CNC AC SERVO)
Surface finish:	As low as 0.2 Ra μmm
X-axis slideways:	Low friction turcite slideways
Operator panel:	Rubisurf Smart Series
Waviness:	Below 70 Wt

ROBINS

Unique revolutionary concept for V6 and V8 cylinder blocks machining

****No Precision Locators Needed****

Reference from either main bearing bores/cam shaft bores or pan rail surfaces!



Machines displayed may include optional accessories

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Signature brand

SG12 SMART Original

HEAVY DUTY

SEAT & GUIDE MACHINES

Simple & Smart

Designing & Manufacturing Patented Technologies | US 17879818 | US 17892165 (Patents pending)

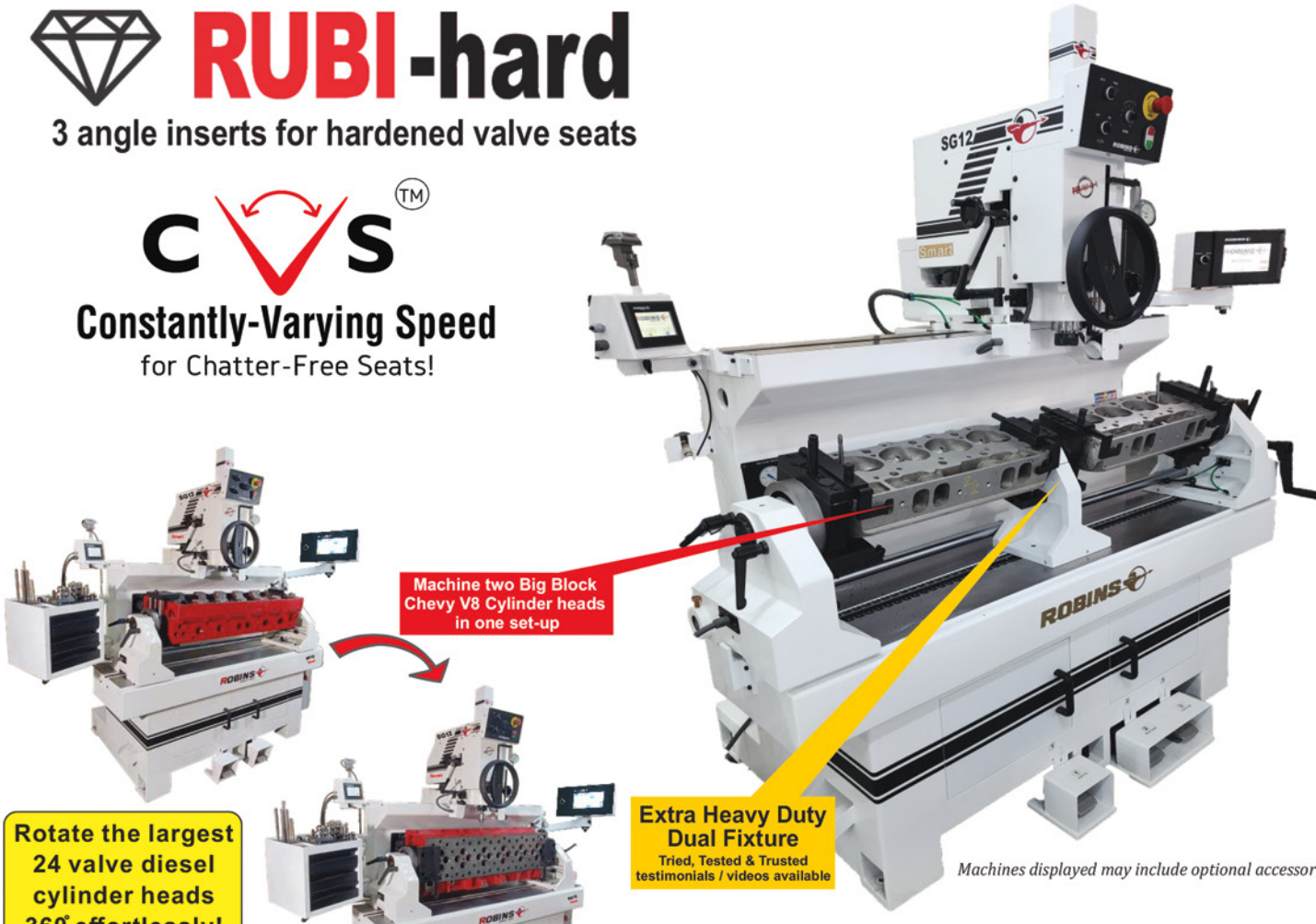
RUBI-hard

3 angle inserts for hardened valve seats

CVS™

Constantly-Varying Speed

for Chatter-Free Seats!



Machine two Big Block Chevy V8 Cylinder heads in one set-up

Extra Heavy Duty Dual Fixture

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Machines displayed may include optional accessories

Rotate the largest 24 valve diesel cylinder heads 360° effortlessly!

ROBINS offer carbide pilots in 0.0001" increments

SG12 HD SMART HEAVY DUTY SPECIFICATIONS

Max cylinder head size	47"L x 15"W x 10"H (1200mm x 380mm x 254mm)
Spindle Stroke	8.500" (216mm)
Spindle Speed	35 - 500 rpm
Spindle tilt	±10 Degrees
Roundness	<0.0002" (5 microns)
Concentricity	0.0002" (5 microns) with Honed Guides
Surface finish	<0.6 Raμmm

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ROBINS MACHINES USUALLY AVAILABLE EX-STOCK U.S.A.

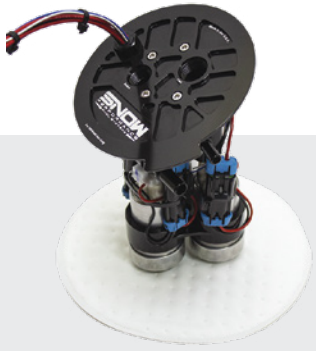
WE ARE GROWING - HIRING INDEPENDENT SALES REPS - Please contact - Jeff or Anthony

PERFORMANCE STEERING COMPONENTS

pscmotorsports.com

PSC's Electric Power Steering Fluid is a high-performance, low-viscosity, broad temperature range oil for use with both conventional and electronic pumps, and is ideal for conventional, Cylinder Assist, or Full Hydraulic steering systems. It's specially formulated to aggressively combat aeration, overheating, and oxidation.

Contact: 817-270-0102



SNOW PERFORMANCE

nitrousexpress.com

Multi-pump fuel hats feature a billet aluminum manifold with CNC-machined passages. The design eliminates the need for hose clamps and rubber or plastic lines that can deteriorate and cause problems. The CNC-machined bodies hold the fuel pumps securely and feature Viton chemical-resistant O-rings and a leak-free fit. These fuel pumps are designed for a return-style installation only.

Contact: 888-463-2781

PRW
prw-usa.com

Platinum Series shaft-mount rocker arm systems come complete with everything needed to improve the performance of Mopar aftermarket wedge cylinder heads. The 2024 extruded aluminum rocker bodies incorporate silicone bronze bushings, roller tips, 5/16-inch ball adjusters, and 12-point lightweight locking nuts.

Contact: 888-377-9779

RADIUM ENGINEERING
radiumauto.com

Radium Engineering has expanded its competition fuel cell offerings to include a 22-gallon size. This new size features a flexible bladder housed in a powder-coated aluminum outer can. Fuel resistant foam is included with all fuel cells. The fuel cell can be combined with Radium's Fuel Cell Surge Tank (FCST) for a complete motorsports fueling solution.

Contact: 503-783-8850

WEDDLE INDUSTRIES
weddleindustries.com

The Weddle S4/S5 side mount starter bellhousing is designed to enable a more compact trans package profile. In road race applications utilizing an inverted trans installation, this bellhousing provides additional ground clearance. All Weddle S4/S5 bellhousings are cast from A356 aluminum and heat-treated to T6 condition.

Contact: 805-562-8600

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AD INDEX

SOCIAL STATUS

A closer look at how racing and performance industry members are using social media to enhance their customer service efforts.

Social media users utilize various platforms as a means to interact with businesses. When customers have problems with a product, need information, or have questions, more of them are now turning to direct messaging (DM) on social media rather than going through a website or phoning the company. So, in addition to using social media for marketing purposes, companies must also maintain quality customer service throughout their channels.

"I have been managing social media for about six years now, and the amount of people who come to social media looking for product information has drastically increased," noted Kasey Tarnutzer of QA1, Lakeville, Minnesota. "A lot of people use it as a way to get a quick response versus sending an email and maybe having to wait a few days for a response. They want to get all the information they can in one place. While our phones still ring relatively consistently throughout the day, we get about 30–35 tech questions a day on our social channels."

Over one billion messages are exchanged between users and businesses every month on Facebook Messenger, and that's expected to continue to increase on all platforms. In recent polling, more than 64% of people preferred to message on social media rather than call a business. And more than 70% of people expect to message businesses more in the future for customer service questions. Additionally, great customer service is motivation to recommend a brand online. So, top-notch "customer service on social media channels is essential," Tarnutzer said.

Depending on the company resources, some businesses prefer to use an automated response to inquiries if they don't have enough manpower to monitor DMs. An automated response typically lets people know that the company doesn't check messages regularly and directs them to call or email for a quicker response, or get more information on their website. Other companies have dedicated staff to respond to all messages in a timely manner. Some utilize a combination of both.

QA1 uses automated messages on Facebook outside of normal business hours "so the end user knows we are not available at that specific moment. But we respond as soon as we can when it's within normal business hours," Tarnutzer said. "I feel that you have to set some boundaries on social media, and people need to understand that we are not always readily available. During our business hours, we do not have any automated messaging. We monitor and respond within that day."

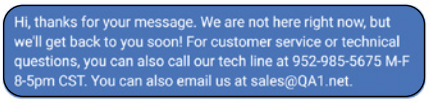
What is an ideal response? First, when appropriate, businesses should always respond to inquiries. A potential customer who reaches out and doesn't get a response can very easily take their business to a competitor. But simply responding is not enough. Response time is just as important.

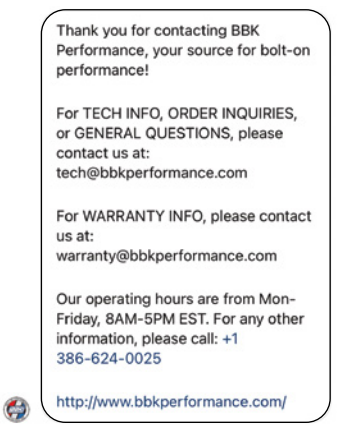
"I would say proper response time is definitely within the day that they send a message," Tarnutzer noted. "Taking the time to respond goes a long way. We do our best to answer all their questions in the messages and get them on their way to their purchase. I often get messages from people saying. 'Wow, I appreciate the fast response,' or 'I didn't even think you guys would read this.'

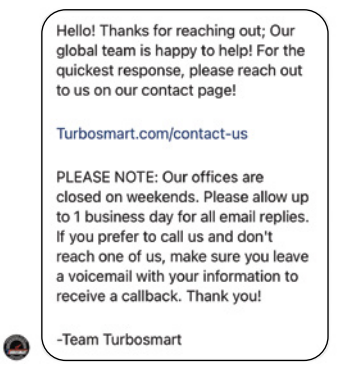
"Having a personality and connecting with them is essential, too," Tarnutzer added. "They need to know they aren't talking to a robot. People who are monitoring social media channels in this industry need to be enthusiasts and share the passion with them on some level. It helps with the credibility and the trust they put in you when asking for help or recommendations."

Some platforms offer messaging features to help with timely responses or "away" responses in off-hours. Facebook has Away Messaging and Instant Replies. Instagram has a similar feature called Quick Replies. In many cases, the automated responses can be customized to provide a more personal touch.

However you decide to handle your social media messaging, just make sure customers are receiving a response, whether automated or otherwise. Quality customer service goes a long way. PRI







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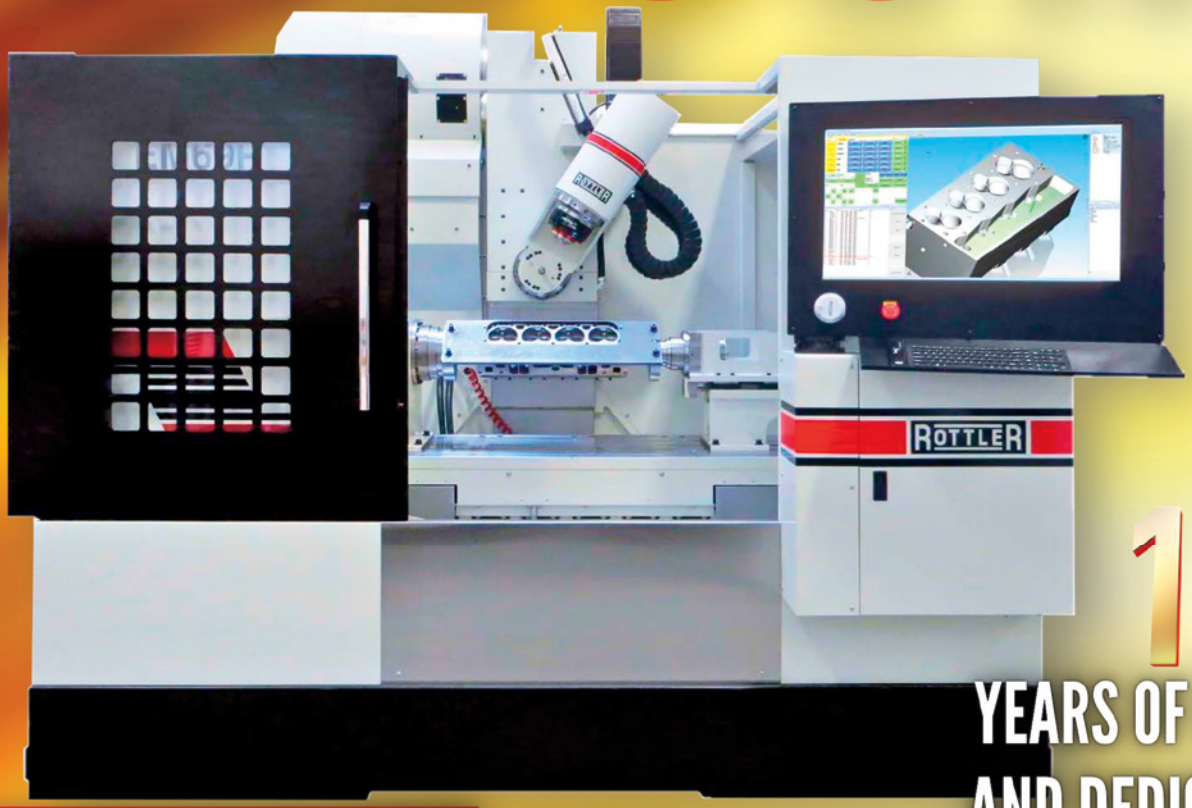

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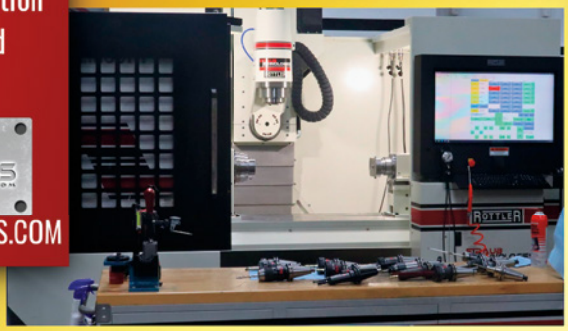

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