

VOLUME 37, NUMBER 8 AUGUST 2022

PRI

PERFORMANCE RACING INDUSTRY MAGAZINE

ROTTLER

PRI 2022

MACHINERY ROW PREVIEW

**THE MANY BENEFITS
OF PURCHASING SHOP
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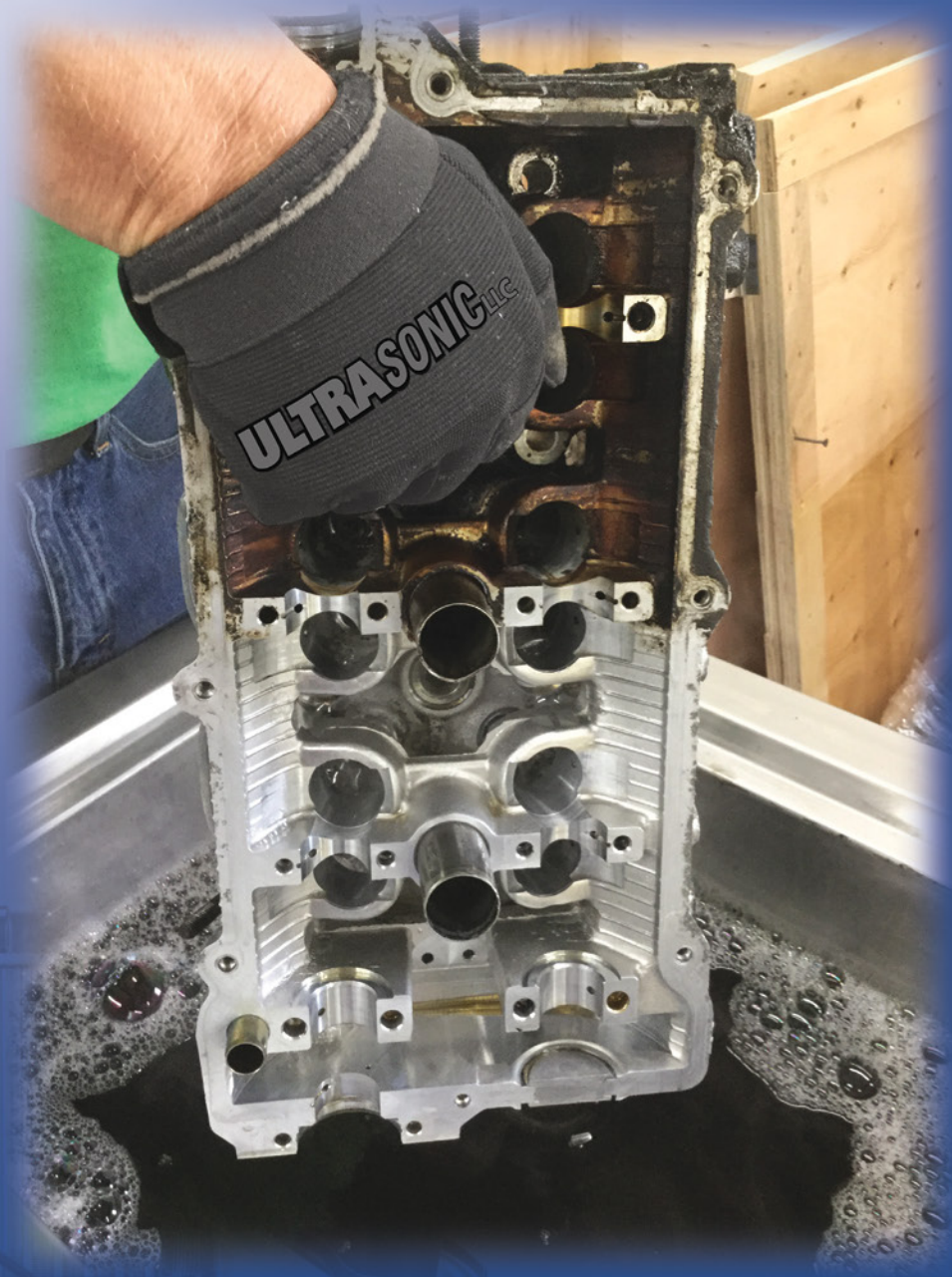
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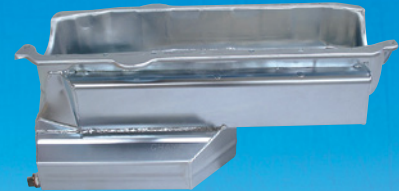
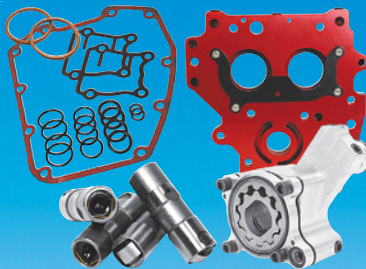
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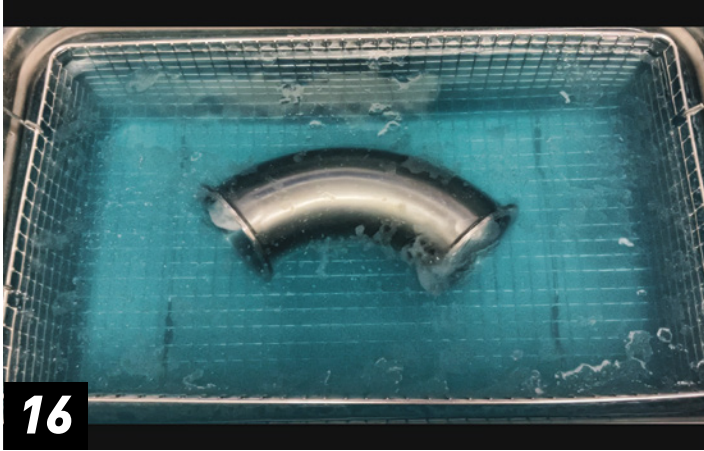


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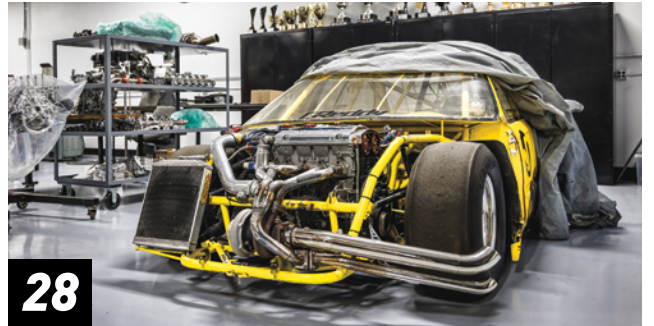
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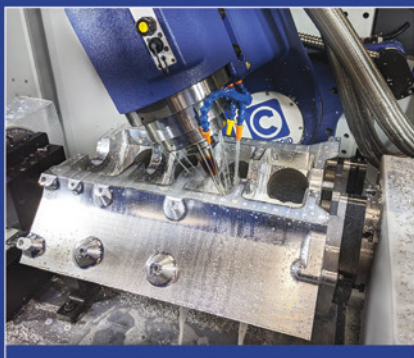


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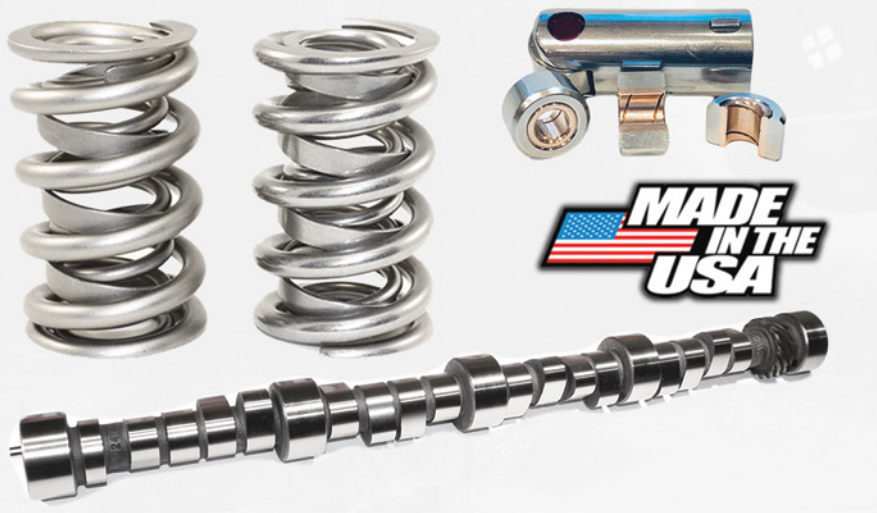




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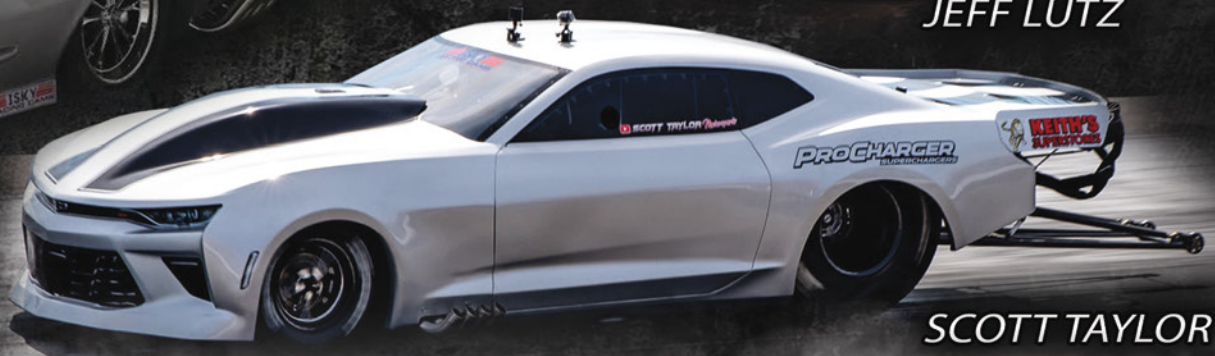
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FROM THE PRESIDENT

Recently, I attended a No Prep Kings (NPK) race in Hebron, Ohio, and it was one of the most impressive drag races I have been to in quite some time. We have all enjoyed the run that Street Outlaws is on, and this in-person event is the culmination of over a decade of brand building, fan development, and storytelling. All of this comes to light as the gates open and thousands of fans make their way into the track.

It started with a call from my friend, Manny Bugginga. Manny is one of many “professional sportsman” drag racers across the country whose program has evolved from a hobby-level interest, but exists on a professional level of effort, funding, and team support. Manny has bounced around sampling the upper level of street car-style drag races, and he’s now interested in No Prep Kings. His team was recently supplemented by

talent, and crowd draw. What you soon realize is that Sam Korkis, show producer and the genius behind the Street Outlaws brand, has poured years of expertise into this in-person experience that would be the envy of any race promoter. Backed by multiple TV shows, No Prep Kings is able to “bring your favorite star to life” with all of the characters that you know/love/hate in attendance, competing as they do almost every night on the Discovery Channel. That relationship has translated into ticket sales as soon as the gate opens; there is also great emphasis placed on upfront sales promotions and VIP access—all presented quite well online and through multiple social media channels.

The cast members themselves are a huge part of the program’s success, as they have bought into Korkis’ vision. And why not? It is working. I watched multiple cast

RACE PARTS MANUFACTURERS HAVE TAKEN ADVANTAGE OF THIS INDUSTRY MOMENTUM FOR YEARS. AND DURING THE EVENT I ALSO GOT TO SPEND TIME WITH GEORGE RUMORE FROM LONG TUBE HEADERS (A PRI FOUNDING MEMBER), NOLAN JAMORA OF ISKY RACING CAMS, AND SEVERAL OTHER FAMILIAR FACES. THESE FOLKS ARE ATTENDING NPK RACES, SUPPORTING THE RACERS, AND ENJOYING EXTREMELY HIGH LEVELS OF BRAND AWARENESS.

longtime friend Carlo Catalanotto, who is himself no stranger to the top level of street car drag racing. Teamed with the best of the Bugginga family (Jen, Lil Manny, and Lilly) as well as a number of key drag racing veterans, Manny’s Mustang—code-named “Fred”—really brings the goods to any starting line it hits.

No Prep Kings is so much more than a drag race. It is a study of class structure,

members with lines of 50–100 people waiting for merchandise sales and autographs for the entire day. I have seen this kind of fan devotion at the upper echelons of motorsports, but it is most commonly seen in professional stick-and-ball sports. I spent quality time with Daddy Dave, Ryan Martin, Murder Nova, Doc, Jeff Lutz, Bobby Ducote, and more. We talked about their success, the impact of Street Outlaws on the racing



DR. JAMIE MEYER
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world, and their support for the Recognizing the Protection of Motorsports (RPM) Act.

Race parts manufacturers have taken advantage of this industry momentum for years. And during the event I also got to spend time with George Rumore from Long Tube Headers (a PRI Founding Member), Nolan Jamora of Isky Racing Cams, and several other familiar faces. These folks are attending NPK races, supporting the racers, and enjoying extremely high levels of brand awareness. Well done to those of you already there...and it serves as a good reminder that brand-building is still happening in our industry—maybe now more than ever.

Advanced digital marketing happens when your brand/product meets your customer, with a trusted third party making the introduction. Street Outlaws has this figured out, as Sam Korkis continues to elevate the entire sport of drag racing. How far can Sam and his cast of outlaws take us? Only the market knows for sure, but after a decade of dedicated competition there’s a lot to be seen here. I look forward to working with Sam, his cast, and the passionate folks who are driving Street Outlaws. We can all learn a lot from them.

Until next month, remember to get your plans made for the PRI Show, December 8–10 in Indianapolis. And, as always, be safe out there. **PRI**

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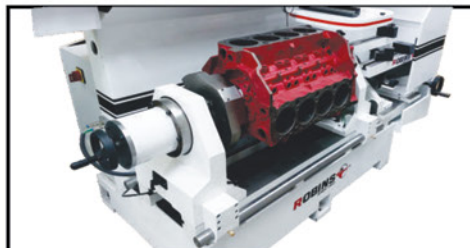
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FROM THE EDITOR

Couple of thoughts as we look ahead to the 61st NOS Energy Drink Knoxville Nationals Presented by Casey's later this month:

1) I THINK IT'S NOT SURPRISING THAT

Stephan Papadakis' career has followed an upward trajectory that shows no signs of leveling off. From his emergence as a local legend in Southern California's sport compact and import scene circa the late 1990s through his transition from driver to owner of the winningest team in Formula Drift history, Papadakis has achieved remarkable levels of success. Spend a few minutes with him, as PRI contributor Jeff Zurschmeide did recently in preparation for this month's Industry Insights column, which begins on page 28, and it's easy to see why. Sure, Papadakis can tune and wrench with the best of them, but what we found particularly telling were his approach to management ("I float in and out of micromanaging") and his philosophy on team-building in motorsports, which he articulated thusly: "[Take] on what you can complete—be realistic about what you're trying to achieve and whether you can do that with the resources you have. Then, networking and reputation are at least as important as performance on track, because at the end of the day, it's not just about winning, it's about people wanting to race with you.... There are so many aspects to motorsports and so much time in motorsports that's not racing on the track, so make sure that you're enjoying those parts." Based on what he's accomplished so far—and his innate desire to always embrace and conquer the next challenge—we'd say Papadakis has identified a winning formula.

2) I THINK YOU'LL APPRECIATE HOW

we came up with the idea for this year's annual Machinery Row Preview, which starts on page 48. It originated from an email that got circulated through the PRI offices back in February. In it, the owner of a well-known environmental products and solutions provider shared that his company



DAN SCHECHNER
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had just closed a major sale stemming from its presence at last year's PRI Trade Show. The order came about "all because of the PRI show," he wrote, "[which] helped them to see the fit and finish of the equipment." I should note here that for our team, it doesn't get any better than this. Hearing firsthand that the PRI Show helps buyers make connections, find solutions, and conduct business with hundreds of the industry's top manufacturers and service providers is our version of turning a 38-second lap at IMS. It's why we suit up. But after exchanging some in-person (and virtual) high-fives on account of our exhibitor's win, it occurred to us that this scenario was not unique, that there was no doubt many of these types of stories out there. We also agreed that these stories needed to be told. Now, all we had to do was find them. That proved to be easier than expected, as the PRI Show exhibitors we contacted were more than happy to turn us on to customers whose equipment purchases at recent PRI Shows had paid real dividends for their companies' operations. Give this piece a read—and in the pages that follow see the dozens of suppliers set to display in this year's Machinery Row. There may very well be an exhibitor or two in there whose products or services could be a game-changer for your business. **PRI**

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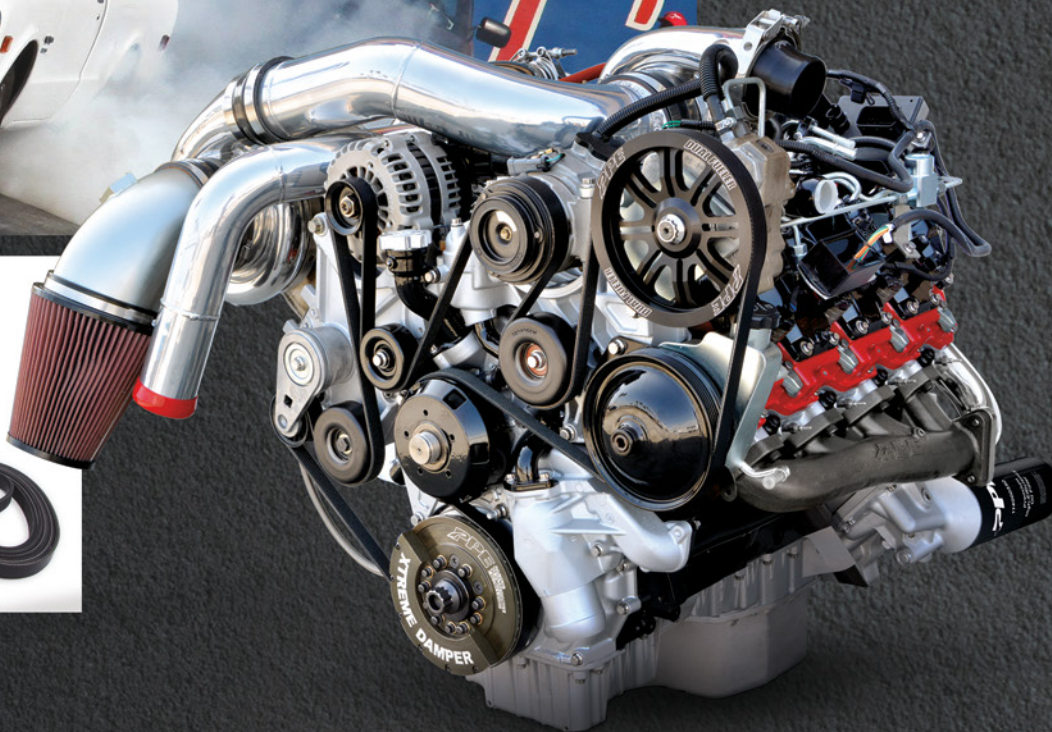
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LEAD POSITION

"Nostalgia is the only friend that stays with you forever." Attributed to writer Damien Echols, this could very well be the clarion call for aficionados of a motorsports niche whose appeal only seems to deepen with age. But what happens when period-correct liveries and provenance come face to face with modern technology? Such is the scenario we uncovered in our reporting on the Nostalgia drag racing market. Among those we spoke with, Mike Rice of the NHRA Hot Rod Heritage Racing Series in Glendora, California, told us the continuous introduction of high-tech equipment and capabilities creates a balancing act of sorts. "Everything evolves," he noted, "so we're under a constant barrage of new products, and we're always considering whether something makes sense for the spirit of the rule or not." For more on how officials and competitors are embracing both the past and future, see our coverage beginning on page 84. **PRI**





ASK THE EXPERTS

PARTS CLEANING MEDIA

When scrubbing down components, should blast media or aqueous solutions be used? Or, is a combination of both the preferred method?

By Bradley Iger

Parts cleaners can make components with decades of grime and corrosion look brand new in just a matter of minutes, but they're not one-size-fits-all solutions. Getting the most out of blast media and aqueous solutions means using the right tool for the job.

BLAST MEDIA

Although there are situations where blast media is a better option than the ultrasonic cleaning method, or vice versa, there are also situations where these cleaning methods can complement one another. As Ron Storer of ABS Products in Brea, California, noted, selecting the appropriate methods and media for a given task ultimately comes down to the job at hand and the parts involved.

"For instance, when I'm cleaning parts for race engines—trying to remove carbon buildup, gasket material, grease, and things like that—I'll use soda. Soda is a one-time-use media, it's biodegradable, and it's a soft enough material that

it will not change the substrate that you're blasting."

Storer pointed out that because soda doesn't change the surface of the material it's applied to, it's mainly used to clean parts rather than change their surfaces. If you're looking to take a part like an aluminum intake manifold back to a factory-fresh appearance, that's a different situation with a different process. "In that case I might use dry glass beads because they would make that part look brand new."

While glass bead media provides a deeper, more intensive clean, he said that it requires more care during the cleaning process, and additional steps may be needed after this process in order to prepare the part for use. "With dry glass beads you need to make sure it doesn't wedge itself in cracks or crevices of the part. The last thing you want to do is have that material come out later on when the part is installed, and you usually can't get it out by just blowing it off or rinsing it."

These beads are ostensibly

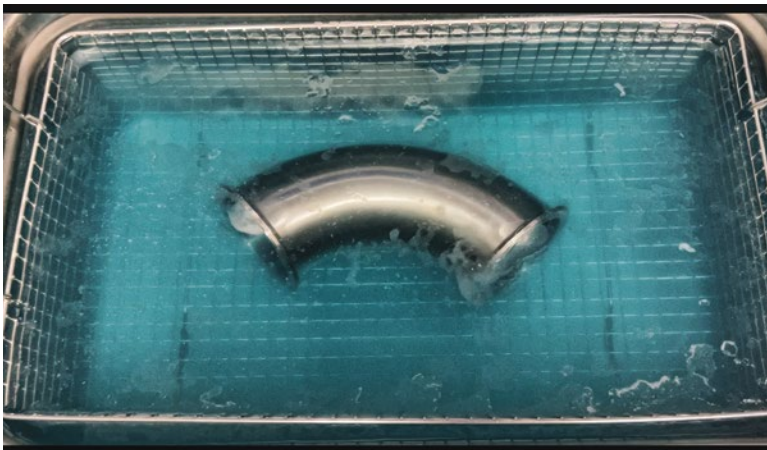
"WE BUILD THE MACHINES AROUND OUR CUSTOMERS' APPLICATIONS AND THE MEDIA THEY NEED TO USE."

microscopic glass marbles. When the beads hit the part, they shatter into smaller pieces with sharp edges, and these shards provide a deep clean that can also polish the surface of the component. That means that dry glass beads can effectively take care of two steps in the parts cleaning process at once, but the media also necessitates an additional preparation step in order to get the part ready for use.

"In a situation where I'm using dry glass beads, I'd run the part through that process first and then I'd put it into an ultrasonic cleaner," Storer said. "Ultrasonic cleaning will loosen up that material through vibrations and get it out of those nooks and crannies."

He also offers hydrosラリー, or wet blasting, as an option that can sometimes take care of both steps. "You might not need to use an ultrasonic process in that case because that's a wet glass bead media, and the water becomes sort of a cushion, so the beads don't impregnate themselves into the part. There's less frictional heat because of the water, and it does yield a smoother finish when the process is

Ultrasonic cleaning is often thought of as a finishing step, said our source from UltraSonic LLC, as it won't remove things like paint, rust, or corrosion. But its aqueous nature allows it to get into blind holes, cracks, crevices, and other places where other cleaning methods can't reach.





Choosing the appropriate blast media for a given task comes down to the part being cleaned and its condition. Among the specialized media available from ABS Products are, clockwise from top left, plastic media, baking soda, steel grit, glass beads, steel shot, and aluminum oxide.

“SODA IS A ONE-TIME-USE MEDIA, IT’S BIODEGRADABLE, AND IT’S A SOFT ENOUGH MATERIAL THAT IT WILL NOT CHANGE THE SUBSTRATE THAT YOU’RE BLASTING.”

completed. But it also takes about five times as long to clean something in comparison to the dry glass bead process.”

ABS Products also offers other blast materials like aluminum oxide, ceramic beads, and plastic, and each has a specialized use. “Aluminum oxide is great for cleaning out rust and corrosion, but you have to be careful with it because it can also remove material,” Storer explained. “A lot of companies we work with prefer ceramic beads for cleaning components because those beads don’t break down as fast, so the media can be reclaimed and used again. Meanwhile, plastic is great for stripping paint and powder coating, and we use steel shot for peening.”

With the variances in both materials and machines, he recommends that those who are new to these cleaning methods consult the machine manufacturers for their recommendations in order to achieve the results they’re looking for. “We build the machines around our customers’ applications and the media they need to use. And like

anything, there’s a certain level of finesse involved in using parts cleaners. You run the risk of ruining a part if you use the wrong abrasive for the wrong amount of time. It pays to get some insight about how to use them properly for a specific set of circumstances.”

AQUEOUS SOLUTIONS

While ultrasonic cleaners can do things that blast media cleaning methods cannot, Jason Shaw of UltraSonic LLC in Amelia, Ohio, told us that it’s generally considered a finishing step in the parts cleaning process.

“Ultrasonic cleaning with our detergents is not going to remove things like paint, rust, and corrosion. In those situations, you’re going to need a solvent or media blaster. If you have very high concentrations of carbon buildup on exhaust ports of a cylinder head, for instance, ultrasonic cleaning can help get that carbon out, but you’d often start with media blast. The advantage of ultrasonic cleaning is that it gets where you can’t touch, see, or feel. It’ll get down into blind holes, cracks, and crevices—places where typical

cleaning methods aren’t going to be able to get to. So if you’ve got a block coming out of the junkyard that’s got a bunch of paint, rust, and other nasty stuff on it, you might run it through a jet wash, then media blast, and then put it through the ultrasonic cleaner to remove that media.”

Since ultrasonic cleaning is often considered a finishing step, it’s also commonly used after machining processes. “We have customers who will use the ultrasonic machines on engines as a final clean before assembly,” Shaw said. “It will remove things like the gray dust inside a cylinder wall. It’s a precision clean that will remove those fine particulates that you’re not going to go after with a media blast.”

Ultrasonic cleaning machines put out a wave that creates a microscopic bubble. Wherever that fluid touches, those cavitation bubbles will impact, implode, and pull the dirt off of that surface. One of the key advantages of ultrasonic cleaning is that detergents like those offered by UltraSonic LLC don’t involve harsh chemicals or solvents, but Shaw noted that the appropriate cleaning agent must be used for the material being worked on.

“It’s important to use the right cleaning agents with motorsports components,” he said. “For instance, with certain billet parts, highly polished components, and especially non-ferrous metals, if you use too aggressive of a detergent, it can discolor that metal and etch it. It doesn’t necessarily hurt it, but it doesn’t make it look good. So you need to be aware of that, and that’s why we provide a chart that outlines what detergent you should use with what materials, how much time you should use it for, and at what temperature. It’s a great reference and starting point for those who’re new to the technology.” **PRI**

SOURCES

ABS Products
abs-products.com

UltraSonic LLC
ultrasonicllc.com

STOP DOING THAT...DO THIS INSTEAD

SHOP MANAGEMENT SOFTWARE

New solutions piggyback on the latest digital advances to provide better efficiency and improve the customer experience.

By Drew Hardin



The digital revolution that completely reimagined phones, computers, and other devices has altered auto shop management as well. Cloud-based systems are available that improve not only shop efficiency but also customer satisfaction. Granted, most of these systems were designed for dealership service departments or general repair shops, but they can be customized to work in a race or high-performance shop environment as well. “From F1 to farm trailer, you can enter it in Tekmetric,” said Prasanth Chilukuri of the Houston, Texas-based management platform.

We recently spoke with Chilukuri and Travis Brown of San Jose, California-based Shopmonkey to learn more about some of the latest developments in shop management systems.

HOW IT WORKS

Details differ among the companies that offer these systems, but essentially they enable transparent communication about a vehicle and its progress with everyone in the shop, from the person writing the order to the technicians to the bookkeeper who sends the invoice. “It’s an all-in-one solution,” said Brown. “Shops don’t need six or seven different tools to get the job done.”

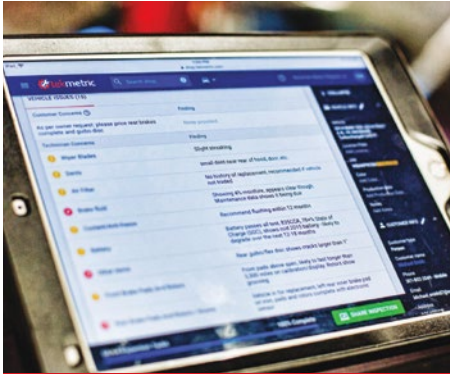
Describing a typical Tekmetric service experience, Chilukuri explained that the system logs in the vehicle; begins the repair order; records a digital vehicle inspection that can be customized for repair, pre-race, pre-sale or other circumstances; adds jobs to the repair ticket as needed, and sources the parts for the repair

Shopmonkey shop management software “was built to be easy to use for everyone in the shop, including technicians and service writers,” said our source. Typically computer upgrades aren’t required for these cloud-based systems, provided the shop has an Internet connection and an up-to-date browser.

(either through the shop’s inventory or outside vendors); then sends the estimate to the customer’s smartphone for approval. Following approval, the system alerts technicians that the car is ready to be worked on and offers them the opportunity to order parts that aren’t in stock. If parts availability presents a bottleneck, the system can “reorganize and reallocate time based on what’s ready to be worked on,” Chilukuri said. “You can push that car down if there’s another car you can get out before it.” Once the work is completed, the customer is alerted via text—“we have two-way texting built into the system”—and the customer can pay from their smartphone and pick up the car at their convenience.

Both companies prioritize intuitive user interfaces for their systems and devices. “Shopmonkey was built to be easy to use for everyone in the shop, including the technicians and service writers,” Brown said. With the popularity of smartphone apps and Zoom meetings, shop staff “are more familiar with technology and come to expect it as standard.”

“Our philosophy has always been simplicity,” Chilukuri said, citing the iPhone as an example of the interface experience they wanted. “You can buy a phone now, and it doesn’t come with instructions. Our system should be as intuitive and easy to use, regardless of your role. You can log in...and use the system with minimal training.” Once [it’s] set up, “you can be up and running



Tekmetric's emphasis has been on simplicity, with a user interface for its system that's intuitive and requires minimal training, said our source. Once the system is set up, a shop can be up and running in as little as 30–45 minutes.

within 30–45 minutes at the most.”

Most shops won't need to upgrade their computing equipment to use these systems. “With SaaS [software as a service] and cloud-based software...you can use your existing systems as long as you have access to the Internet and a modern browser,” said Brown.

A shop doesn't even need a super-fast Internet connection to run [these systems], Chilukuri said. “A Wi-Fi connection is great, but the system is so performative that it will work fine with low-speed Internet. I've done demonstrations tethering off my cell phone in an airport parking lot and it worked just fine, but the stronger the Internet connection, the faster you can be productive.”

IF IT AIN'T BROKE...

Why consider adopting an auto shop management system if a shop is functioning fine without one? First, they can significantly improve shop efficiency, which, according to Brown, translates directly to increased revenue. “We've found, within the first year of shops using [it], on average they're growing their revenue nearly 40%,” he said. “We chalk that up to internal operational efficiencies, process optimization, and clean communication with their technicians, service writers and partners.”

“We measure a few different things,” said Chilukuri. “Probably the largest one is ARO

“YOU CAN BUY A PHONE NOW, AND IT DOESN'T COME WITH INSTRUCTIONS. OUR SYSTEM SHOULD BE AS INTUITIVE AND EASY TO USE, REGARDLESS OF YOUR ROLE.”

(average repair order). We typically find customers who use [these systems] increase their ARO by 20%, and the driver for that is transparency. They're able to present pictures and videos of required work so the approval process is much more fluid. And it allows cycle times to go much faster. They're getting vehicles out faster, which increases ARO and profitability.”

Another reason is customer satisfaction. “We're at an age where customers don't want to sit in your waiting room,” observed Chilukuri. “They don't even want to wait in line at Starbucks. They just want to walk in and pick up their cup of coffee. That's the experience people demand now, and we want to arm our customers with that, so they can give their customers the best possible experience.”

“I want to take my car to where I trust the shop owner, and I know that I can send them a text message, they can send me a picture back, and I can pay online,” said Brown. “These are all very modern expectations that have been further solidified around the contactless experiences we've had in the last couple of years.” **PRI**

SOURCES

Shopmonkey
shopmonkey.io

Tekmetric
tekmetric.com



NEO HPCC-1

Use Neo Synthetics

HPCC#1 Joint

Grease for Your

UTV/SXS

Neo Synthetic Oil
2871 Gundry Ave.
Signal Hill CA 90755

Ph: 1-562-595-7208
Email: Neooilusa@gmail.com

NeoSyntheticoil.com

MAKE THE CASE

QUARTER-MILE VS. EIGHTH-MILE DRAG RACING

The two styles of competition not only attract different types of racers and audiences, they also require different car setup tactics and come with their own maintenance considerations. As our advocates explain, each format offers a unique allure that keeps participants coming back for more.

By Bradley Iger



QUARTER-MILE DRAG RACING ADVOCATE:

**Andy Warren,
NMCA Nostalgia Muscle
Competitor**

I actually got my start in racing with eighth-mile bracket racing events. It was kind of the norm around where I lived. When we started following the NMCA in the 1990s, my brother and I would travel to Memphis every year for the finals, and I remember that the nostalgia classes really stuck with me.

By the early 2000s I was ready to do something different, and one day I was looking around on the NMCA website and saw that there was an upcoming race close by in Bowling Green. I had never really raced quarter-mile before, but I found out that they had a class that my car fit in with Nostalgia Muscle.

“REAREND GEARING TENDS TO BE VERY IMPORTANT IN QUARTER-MILE RACING, AS IS TIRE SELECTION, BECAUSE TIRE GROWTH NEEDS TO BE TAKEN INTO CONSIDERATION MORE THAN IT USUALLY DOES IN EIGHTH-MILE RACING.”

After competing in that race I was totally hooked. There's just more of a thrill to it. That extra few seconds might not seem like much, but it makes a big difference when you're behind the wheel. In eighth-mile racing, you hit third gear and you're done. But in a quarter-mile race you have a little bit more time to experience everything, and to me that's just more bang for the buck.

NMCA Nostalgia Muscle is a pre-set index class that goes from 16.0 to 9.50, and because of my driving style, I prefer to chase. With a quarter-mile format, once you cross that eighth-mile mark you kind of clear your mind and figure out what you're going to do from there. You have a lot more time to think about what you're doing with this format, and it's a pretty awesome feeling to pass a slower car right at the last possible second.

The quarter-mile format also has more visibility because there are more nationally publicized platforms for this type of racing through the NHRA, NMCA, and other organizations. That has some clear marketing and sponsorship advantages.

I don't think I would have had the same opportunities if I was running eighth-mile because those events just don't have that spotlight on them.

This format tends to be harder on valvetrain parts because you're holding the engine near redline a bit longer, but it has durability advantages in other parts of the car. Unlike eighth-mile racing, you don't have to be super aggressive with your gearing out of the hole because you need the gear to keep the car pulling at the other end of the track. So it tends to be easier on the transmission, rearend, and other drivetrain hardware.

Rearend gearing tends to be very important in quarter-mile racing, as is tire selection, because tire growth needs to be taken into consideration more than it usually does in eighth-mile racing. If you're running a bias-ply slick, your tire is going to grow in diameter at speed because of the centrifugal force, and that will affect your final gearing at the end of the track. The tire acts like a big rubber band—the faster you spin it, the more it wants to spread outward.



EIGHTH-MILE DRAG RACING ADVOCATE:

**Todd Tutterow,
NHRA Pro Mod Competitor**

I like running quarter-mile races, but I think that one of the biggest advantages that the eighth-mile format has is that it's a bit easier on parts, and that makes it more affordable to compete. Connecting rods, valve springs, and other engine components will take a lot more abuse in quarter-mile racing. It might just be a few more seconds for a run, but those are seconds that I could be putting into more eighth-mile passes. Because of that, we also find that we can run the car harder in the eighth-mile format. But sooner or later you will find the weak link in the setup regardless of the format you're running in.

Because these runs are shorter, you really can't afford to give anything up in eighth-mile racing. You've got to put all the power down and do it quickly because all of the ET in an eighth-mile race happens early. Big horsepower tends to matter more for the top end in quarter-mile races, so lower horsepower cars aren't at as much of a disadvantage in the eighth-mile format. Gearing tends to be the biggest difference in car setups between eighth-mile and quarter-mile formats for the type of drag racing I do.

Either way these cars are extremely fast—we're hitting about 215 mph in the eighth. The quarter-mile adds another 50 mph on top of that, so eighth-mile racing feels a bit safer as well. At those speeds there's just

a lot more danger in a quarter-mile car; two seconds doesn't seem like a lot, but it makes a big difference. And while the cars keep getting faster and faster, the shutdown areas at these tracks haven't gotten any longer. Fortunately, most of the eighth-mile stuff that we compete in now runs on the bigger tracks, and having that extra room to get the car slowed down provides an additional measure of safety.

Because eighth-mile racing doesn't have national events like the NHRA and other organizations have in quarter-mile racing, there tends to be slightly less visibility. Some sponsors prefer quarter-mile formats because they can pull in a different audience due to the TV coverage and things like that, but ultimately it hasn't really been an issue for the sponsors that we work with. And I think that the eighth-mile racing benefits the fans because it's easier to see the entire run. It makes for a good show.

The format seems to attract more Outlaw-style series, which really seems to resonate with a certain type of fan. Most of the quarter-mile stuff has pretty rigid rule sets, but the eighth-mile series tend to be less tightly controlled. Those open rule sets generally allow for more innovation, and it makes the competition more interesting as a result. It all works together to make these eighth-mile events feel less sterile, which in turn attracts the fans who value that. **PRI**

"MOST OF THE EIGHTH-MILE STUFF THAT WE COMPETE IN NOW RUNS ON THE BIGGER TRACKS, AND HAVING THAT EXTRA ROOM TO GET THE CAR SLOWED DOWN PROVIDES AN ADDITIONAL MEASURE OF SAFETY."

EDITORS' CHOICE

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

MAX-LIFT BSR SHAFT ROCKERS FOR LT

COMP CAMS

compcams.com



Testing at COMP Cams in Olive Branch, Mississippi, once revealed that LS engine valvetrain deflection measured on the Spintron was not matching the predictions calculated in sophisticated computer simulation and modeling software.

"Deflection is an enemy for performance over a wide rpm range, because the component loads go up by more than the square of engine speed," explained Billy Godbold. "And your running duration at the valve shrinks as system loads and resulting deflection increases."

Engineers determined that the software assumed the rocker-arm trunions were fixed when, in fact, the aluminum stands would flex when loaded. Armed with that knowledge, COMP Cams developed the patent-pending Max-Lift BSR shaft-rocker system for the LS. That technology is now available for the GM Gen V LT engine family.

This bolt-in system increases the valvetrain stability by tying pairs of rocker arms together and using tri-layer bushings instead of needle bearings. The increased stiffness in the valvetrain allows more aggressive camshafts up to .675-inch valve lift.

"With the BSR rocker systems, we increase the stand and system stiffness, resulting in less duration loss with rpm, increased power, and improved valvetrain dynamics, all with a very simple, elegant, and robust improvement," concluded Godbold. —*Mike Magda*

MD-SXS/UTV CHASSIS DYNO

MUSTANG DYNAMOMETER

mustangdyne.com

The increasing popularity of racing UTVs and side-by-sides prompted Mustang Dynamometer in North Las Vegas, Nevada, to develop a powersports chassis dyno. This low-profile design with 12.625-inch rollers will support up to 850 horsepower while topping out at 200 mph.

“Mustang routinely expands its product line as the needs of the market change. We felt there was a need for a dedicated side-by-side and UTV offering that could also handle motorcycles,” said Michael Caldwell. “There was clearly a need for this product and, thus, we stepped up and designed one.”

The system features a closed-loop digital controller with web-based HoleShot software. Also included is the patented Virtual Road Simulation technology. The dyno requires 230V single phase while the controls run on 115V single phase. The loading device is an air-cooled eddy current power absorber.

“The unit requires a 20-foot long by 10-foot space to accommodate the test bench and the ramp,” added Caldwell. “The unit can handle wheelbases up to 134 inches, so we have plenty of platform for those four-seaters and longer wheelbase platforms.”

“The MD-SXS/UTV is primarily meant for off-road vehicles that can be switched to 2WD mode in lieu of 4WD mode for dyno testing,” added Caldwell. “If there is a substantial shift to a full-time AWD transmission, we will definitely add an AWD option to the dyno.” —Mike Magda



HYPERSPARK MASTER KITS

HOLLEY PERFORMANCE PRODUCTS

holley.com

The Holley Sniper product line has long been introducing EFI to a variety of engine applications, but a matching, streamlined ignition system with the same simplicity wasn't available—until now.

“The purpose of the HyperSpark Master Kit is to make the jump from carburetor to Sniper EFI as simple as possible for the enthusiast or racer,” said Evan Perkins of Holley Performance Products, Bowling Green, Kentucky. “Now, users can have a modern, high-current, computer-tunable ignition that only requires four flying lead connections.”

The system features a true plug-and-play harness with the four flying connectors—switched power, battery positive, battery negative and fuel pump power. There's also a built-in 40A relay that provides power to all the system components.

“The biggest benefit for a weekend warrior is the



ease of installation,” added Perkins. “The ignition is also built around the Sniper EFI platform, which maximizes compatibility and minimizes troubles with antique or tired factory ignitions.”

The system is complete with an ignition box, coil, distributor, and harness. The distributor features a Hall-Effect crank trigger sensor that provides noise-free rpm signal to the Sniper ECU. Making the installation even easier is a patented clear installation cap that eliminates confusion over phasing the distributor to set the #1 plug wire.

Tuning is easy with the Sniper EFI software, and rev limits can be set as a safety measure, according to Perkins. —Mike Magda

TS-03 TIRE SCRAPER

UNITED RACE PARTS

unitedraceparts.com

Race teams that beat up their tires on asphalt courses will surely appreciate the TS-03 tire scraper available from United Race Parts (URP) in Troutman, North Carolina, which is an authorized distributor for Greaves 3D Engineering.

"It's been one of our most successful products," said Bryan Powell. "[Crew members] used to use a putty knife and torch to heat up the rubber."

The TS-03 features a molded handle for user comfort. The integrated heat gun offers variable fan speed that provides 300 to 600 liters per minute airflow. The heat gun also has a temperature range of 100 to 600 degrees with a total 2,000-watt output. The adjustable handle and blade positions can be set to suit the user.

"This tool makes it a lot easier and faster for the teams," said Powell. "It is a much more precise way to clean the tire and check for wear."

Both oval and road-course racers can avoid unwanted tire damage due to using inappropriate tools or excessive heat with other methods. The TS-03 can safely remove debris and leave a smooth, undamaged surface.

"We've actually had kart racers use them as well as the sports car teams," said Powell.

A scraper station is also available from URP to help improve the speed and efficiency of the TS-03. The station secures the tire for ease of scraping, and a foot pedal is used to rotate the tire when needed. —Mike Magda



KRC-1040 QUICK-DISCONNECT THROTTLE LINKAGE

KLUHSMAN RACING COMPONENTS

krcracing.com

If you're looking to change carburetors quickly in the pits, the 1040 quick-disconnect throttle linkage from Kluhsman Racing Components in Lockwood, Missouri, will save time. It's also designed to be adjustable, helping control wheel spin with a long foot pedal for a rough slick track, or a short-throw foot pedal for tacky smooth tracks.

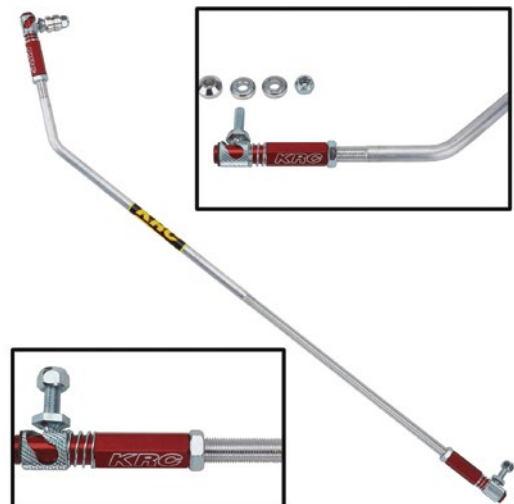
Made in the USA from 6061 aluminum with steel safety locks, the linkage has smooth throttle balls for more precise control. It's designed for dirt track or asphalt stock cars, off-road vehicles, and drag-racing applications.

"This product was actually drawn out on a cocktail napkin in a motor coach," recalled Mel Kluhsman, adding that tech inspectors were often removing carbs to check for cheating. Most of the linkages were made of Heim fittings shimmed with washers and secured with small nuts—both of which often fell into the intake manifold or were lost on the ground. "It took about four or five designs to finally end up with the patented KRC-1040. It's on thousands of cars now."

The throttle rods will hook up to most carburetors with the included bushings. The rod ends are anodized to withstand severe racing conditions.

"The KRC-1040 is very useful during carburetor swaps," said Kluhsman. "Simply unlock, pull the carburetor off, make sure you have another KRC-1042 (throttle ball assembly kit) installed on your carburetor. Then you're ready to go."

—Mike Magda



SRP PRO 2618 LS PISTON LINE

JE PISTONS

jepistons.com

JE Pistons in Cypress, California, now has a complete line of pistons constructed from 2618 alloy for the LS engine family. There are more than 100 off-the-shelf part numbers with specifications that will cover most applications.

“Street/strip applications are covered in a pretty wide range of power goals,” said Bryce Mulvey. “These are 2618 pistons with sportsman level pricing, so they’re ready to handle everything from NA builds to moderate power adders.”

These pistons are designed with Multi-Fit valve pockets to accommodate popular 12- and 15-degree LS cylinder heads. They are CNC machined with performance style cam-and-barrel skirt shapes to reduce piston rock and improve ring seal.

Other features include offset wrist-pin bores, low-friction skirt coating, and an accumulator groove between the top and second rings. This groove helps reduce pressure from combustion gasses,



thereby reducing ring flutter. All part numbers include wrist pins, locks, and Pro Seal rings.

Piston strength is enhanced with a stout .225- to .235-inch top land thickness.

“Doing all our forging in-house in the USA gives us complete control over the manufacturing process and allows us to easily adapt techniques and conditions to achieve the necessary goals for specific parts,” added Mulvey. —*Mike Magda*

PISTA 6-PISTON CALIPER

BREMBO

brembo.com



For intense competition, Brembo in Plymouth, Michigan, has developed the new Pista FF family of brake products, including the FF6 six-piston caliper. “This new line of brake calipers is ideal for use on the track, allowing drivers to get the most out of their cars under extreme conditions in a constant search for the best lap time,” said Mike Messina.

This caliper is constructed of forged aluminum, asymmetrically designed, and radial mounted. Pista calipers were engineered with internal brake fluid passages that efficiently channel the brake fluid for maximum pressure and bleedability of the system. The calipers also have a rapid release system for the pads to help speed up pit stops.

“As a whole, Brembo’s new line of Pista products is the perfect next-level upgrade for so many of today’s highly capable road cars seeing more and more track time,” added Messina.

All the new design elements contribute to improved pedal feel and feedback to the driver, along with consistent repeatability and reliability. The system is also available with a four-piston caliper. —*Mike Magda*

NEWLY APPOINTED

KEVIN McDANIEL

Relying on their expertise in one of the most competitive business segments, the McDaniel family is applying the tenacity learned from the grocery industry to reviving a drag strip on Florida's Panhandle.

By Jim Donnelly

Food and grocery industry veterans Kevin and Cody McDaniel saw an opportunity in reviving a Florida track with a large investment. Their business relationships have already paid off in a big way.

Taking a different direction for this month's Newly Appointed column, PRI spoke with Kevin McDaniel, who with his wife Tonya and brother Cody purchased the former Powerhouse Dragway in Fountain, Florida, in the state's Panhandle, in 2021. Renamed North Florida Motorplex, the track reopened in March of this year with a new racing surface, lighting, timing system and tower, bleachers, and a host of other upgrades.

The McDaniels own a chain of Piggly Wiggly Food for Less stores and used their food industry experience and contacts to attract sponsors and develop new payout and prize structures. North Florida Motorplex is now an IHRA member track. The main eighth-mile is called Thunderstruck Dragstrip, and a dirt drag strip is in the works.

McDaniel recently discussed the track's renovations, new race events, sponsorship and prize programs, and spectator-focused upgrades.

PRI: What changes have been completed at the track?

McDaniel: We tore down and replaced the old tower, concession stations, and bleachers. We hired Charles Jordan's Bleacher Builders. He buys and refurbishes aluminum bleachers from other tracks. The metal structures in ours came from

Daytona International Speedway. Kurt Johnson's Total Venue Concepts spent two weeks grinding, profiling, and resurfacing the track. Many racers have complimented it, saying how flat it is. We installed a new Accutime timing system and concrete barriers.

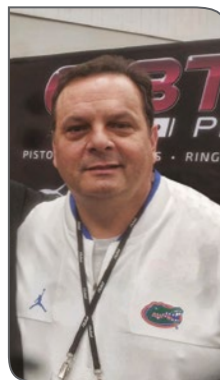
PRI: What are the biggest changes made to attract spectators and improve their experience?

McDaniel: We've added covered VIP decks that have bars at both ends, big-screen TVs, and food available. People can come out to enjoy the racing, stay out of the sun, and keep up with the weekend's ball games. We've added another 1,500 general admission seats and also tailgating spots, which have been popular.

We're building a great bracket program, but bracket racing alone doesn't bring in spectators. So in addition, we're going to have five to six key events a year, like Night of Fire [nitro cars], Street Outlaws, and Pro Mod cars. We're hosting a JJ's Arm Drop event and Carolina No Time nights.

PRI: Tell us about the biggest changes made to improve the experience for racers.

McDaniel: We've added utilities in about 75 spots in the pit area for racers to buy water and electricity for their RVs and equipment. We're now selling VP Racing Fuel and Hoosier tires at the track. We're building up our Monster Energy Championship Bracket Racing Series, and I think it's really going to explode next year. We're paying out \$60,000 this year and already have sponsors returning



KEVIN
McDANIEL

TITLE:

Co-Owner

ORGANIZATION:

North Florida Motorplex

HOMETOWN:

Grand Ridge, Florida

FAST FACT:

Kevin McDaniel, 56, fondly recalls his own bracket racing at this same track in the 1990s and early 2000s.

for next year. Our new Firecracker 128 bracket race in July has 100% payback.

PRI: How has your food industry involvement benefited management of the track?

McDaniel: I went to that market for sponsorships to give our vendors return on investment. They responded in a big way. In the new concession stand, everything we're selling is from a sponsor. Jambalaya Girl has been one of our best-selling items. We have that in our stores. We have a great relationship with Coke. The Coke platform includes Monster Energy, Coca-Cola, Body Armor, and Powerade. We have sponsorships from all four. I know other track owners don't have this advantage, but we're using every advantage we can.

We're in one of the most competitive businesses in the world—groceries. We're up against Amazon and big box stores. You have to make yourself a little different to stand out. That's what we're also trying to do with the track.

PRI: What are some new sponsorship programs?

McDaniel: In addition to the payouts, we came up with the Coca-Cola Redline Club. For \$75, racers are eligible for cash prizes and other giveaways over the season. The members' cars will all have a decal for Coca-Cola Redline Club, so that's advertising for Coke.

Sponsors have put up nearly \$40,000 in prizes. Sunset Luxury Properties put up a week's vacation at a luxury beach house in Panama City, Florida, valued at \$13,000. Any

club member that races on a Saturday is entered in a drawing for that at the end of the season.

As other examples, Jambalaya Girl is giving away a year's supply of its mix and \$5,000 cash, which we'll disburse in smaller amounts. Lincoln Electric is giving away a welder, and Hoosier is giving away sets of slicks to the five racers who have the most visits to the track. We have about 85 cars in so far, even Pro Mod guys. They jumped on a deal from Coke that pays \$1,000 to whoever breaks the track record and holds it for the night.

PRI: Which attributes of your grocery business success would you say could be directly applied to improving North Florida Motorplex?

McDaniel: I would say customer service and building relationships. We strive for great customer service in our stores. We have great connections and relationships with our vendor community and manufacturers in the food industry.

PRI: What are some of the most important challenges facing race tracks today? How will you address that with North Florida Motorplex?

McDaniel: Our biggest challenges are supply chain and the price of fuel affecting affordability of drag racing. We may expand weekend races to three days to reduce the number of trips racers have to make to the track, to help reduce their costs.

PRI: What are some areas where tracks can do a better job?

McDaniel: I would say focusing on making the track an outing for families, not just catering to race fans. Big race fans might sit in the Florida sun to watch racing all day, but not everybody wants to do that. You have to offer something else that's fun, too. We have 12-and-under free every day. We're considering adding a game room.

PRI: What does success look like for you?

McDaniel: Racers are a bit like grocery customers—creatures of habit. You have to break that habit to get them to come out and try you. When we're able to bring in a lot of good racing talent once a month, get the bracket program to where we have 150 cars consistently, and get attendance up consistently, that would be success. **PRI**



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INDUSTRY INSIGHTS

STEPHAN PAPADAKIS


From drag racing to drifting to content generation, this driver-turned-owner of the winningest team in Formula Drift history describes what motivates him, how motorsports is changing, if he plans to return to the driver's seat someday, and what's left for him to achieve.

By Jeff Zurschmeide

Stephan Papadakis is the founder and owner of Papadakis Racing, a professional drifting team based in Carson, California, which has been competing in the Formula Drift series since 2004. With four championship titles, Papadakis Racing is the winningest team in the history of the series. Fredric Aasbo, a Papadakis driver, is doing his best to earn a fifth title for the team as he stands second in points halfway through the 2022 season (when this issue went to press).

But there's much more to the Papadakis story than simply fielding drift cars. Papadakis has broken new ground in past efforts, including the first front-wheel-drive, tube-framed drag racing car in US competition. The Papadakis team earned multiple championships and records in drag racing before turning to drifting. Today, a big part of the team's public presentation is a YouTube channel with detailed tear-down and build-up videos, and the channel is backed up with a healthy social media effort, including more than 133,000 followers on Instagram.

Papadakis' success on track and online has led to desirable partner relationships with Rockstar Energy Drinks, Toyota Racing, Nitto Tires, AEM, and Motegi Racing, among many others. Toyota has even featured Papadakis cars in its commercials for the new GR Supra and GR86. We sat down with Papadakis to dig a little bit into his secrets for success.



"I'VE ALWAYS BEEN ATTRACTED TO SPORTS THAT HAVE A VERY THIN RULEBOOK WHERE YOU CAN DESIGN OUTSIDE THE BOX BECAUSE THE RULES ALLOWED IT. IMPORT DRAG RACING WAS LIKE THAT, DRIFTING IS LIKE THAT, AND THAT'S WHAT KEEPS ME MOTIVATED."

PRI: How did you get started in this business?

Papadakis: I got into racing at 13, 14 years old. I was really into radio-controlled cars. Once I got my driver's license and realized I could modify and race real cars, I wanted to be a race car driver. But then I realized that was expensive! You have to go to the race track and do all these things that my family wasn't into. But I had a bunch of other friends who were all mutually interested in motorsports, and we learned how to work on our cars. We'd go to the local drag racing events, and I just kept learning and kept making friends and networking. After high school I worked at a place that built racing car engines, where I could learn how to work on cars better. Around 1999, I was really continuing to invest in my racing, and at that same time, the sport compact and import scene was really rising, and we were doing

Papadakis Racing has been competing in the Formula Drift series since 2004 and is the winningest team in the series' history with four championships. This year, driver Fredric Aasbo is gunning for a fifth title in the team's GR Supra. Photo courtesy of Formula Drift.

events like Battle of the Imports, Pomona, and different local drag racing events.

PRI: This is when you started having real success in drag racing?

Papadakis: At that time, I was running a front-wheel-drive Honda drag racing car. That scene was really blowing up all over the US around the time the Fast & Furious movie came out, and they started having all these import events. I had a really quick car that people were interested in watching, and I started going to the different import events across the country. I was getting into magazines and DVDs and things like that. I was able to get sponsorship and just built the team from there.

PRI: Getting those first sponsors is never easy. How did you bootstrap that process?

Papadakis: We'd do more events each year, get a little bit more sponsorship each year, continue to reinvest in making the car quicker, and make sure that we were promoting the sponsors well. It evolved over the past 20-plus years into what we're doing now. I went from drag racing into drifting, and we've always tried to build the most cutting-edge vehicles in our space and also

to be on the front end of where people are getting their information. Like I said, it was magazines for a while, and websites, and now it's our own content.

PRI: Let's talk about that content. How do you figure out what to cover, and how do you produce the videos?

Papadakis: We work with Jen Horsey, and she's great with marketing and communications, but she's also great when we talk about content. For a YouTube video, I'll brainstorm with her about a concept and the story we're going to tell. Then we'll collaborate on editing and make sure that we always come out with something that's interesting and compelling for somebody to watch.

PRI: What does it take to operate at the top level in the Formula Drift championship?

Papadakis: It ties into the reason I like motorsports, which is that I like progression. I like having something that we're always trying to evolve and make faster. I mean, it's definitely a team effort. You have to have a driver who is quite good. You need a

“ONE OF THE REASONS THAT DRIFTING HAS INCREASED IN POPULARITY IS THE ACCESSIBILITY OF THE TEAMS, THE DRIVERS, AND THE WHOLE SPORT.”



reliable race car that has good speed and handling and that the driver's comfortable with. You need to have a strong team as far as resources. We work with Toyota, Rockstar Energy Drink, and Nitto Tires, and several other companies within the industry that allow us to continue to invest in the race car and go testing. Whether it's making more horsepower or figuring out how to make the car handle better and have more speed and more angle, we work on a lot of different things that make a competition drift car competitive. Because of our team, we can continue to invest time and resources into that.

PRI: Do you have a management style or a secret to getting top performance and results out of your team?

Papadakis: Motorsports is typically filled with passionate people. They're there because they love to be there. Number one, we work with people who want to be at the track, and they want to win. Then, we're very analytical.

"EACH YEAR OR SO, I TRY TO LEARN A NEW SKILL."

We have goals of, let's say, winning an event, and then if we don't win or we don't do that well, we analyze what happened and we ask where we can improve. Then we focus on improving in those areas. It could be speed or could be reliability, or it could be spare parts if something goes wrong. We make sure that next time we go and compete, we've resolved those shortcomings, and it continues to evolve the program to where it's more competitive.

PRI: If I asked your employees about your management style, would they say, "Stephan gives me a goal and turns me loose," or "He's over my shoulder the whole way?"

Papadakis: I float in and out of micromanaging. I micromanage a bit to

make sure that whoever's working on a project is on track, and then I let them go with it. If they do well, then I give them more. If they are challenged in some way, then we find out why and try to resolve that. I use a lot of communication, a lot of lists. I'm really into writing things down and having a set of goals. If we're maintaining the vehicle, what are the items that we're maintaining, and making sure that we are completing each one of those items. If we have some goals

Before he entered the drifting world, Stephan Papadakis made a name for himself in the import drag racing scene, piloting the first tube-chassis, front-wheel-drive Honda in US competition. His success and the resulting media attention opened doors to sponsorships and his being able to form a race team.





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Stephan Papadakis, seen here at his company's engine dyno, got his start in the performance business working for a race car engine builder so he could "learn how to better work on cars."

on performance, what specifically are those goals, and how are we going to get there? We write those down and then we work on accomplishing those goals. So, having a clear definition of where we are, where we're trying to get, and then the path to get there. That's the thing with motorsports that I like: Each time you go to another competition, you are basically getting graded on how well you achieved those goals.

PRI: How many people are employed at Papadakis Racing? Are your drivers employees or customers?

Papadakis: We have all of that. As far as employees go, we have Fredric Aasbo who drives, and I have two other full-time technicians at the shop. Then when we build a car that takes a certain skill set, we'll bring in experts in fabrication and vehicle building for the period of time that we need. If we have something like engineering, something that could be electronic or mechanical, I'll deal with some consultants specifically on those projects. But we don't build cars all year long, so we'll use those contractors for a period of time. Then when we go to the racing track, we go from a smaller team of three or four who are normally at the shop up to about 12. We have contractors and technicians and a truck driver on the event weekends, so there's more of us.

On the driver's end, we've got Fredric who drives the Rockstar Supra. He's in our program where we work with all the sponsors and manage all of that. Then we've got

Ryan Tuerck and Jhonnattan Castro, who have their own sponsors, but we handle their vehicle builds and logistics. They're not employees; they're more of a partnership.

PRI: Is there something special that you look for when you're hiring somebody?

Papadakis: Experience will be number one, and it's because with racing and building these cars, they need to be done right the first time. We have to build cars on time and on budget. We can't be learning as we're doing it. Secondly, they need to be able to complete projects. There are a lot of great fabricators, but they're challenged with finishing their projects on time. I work with folks who have a reputation for completing projects on time and properly the first time.

PRI: Are there any leadership traits you've picked up over the years?

Papadakis: When I was younger, I was really interested in Robby Gordon, the off-road racer, but he did Indy cars, he did off-road, later he did NASCAR, Trans-Am, and he was quite successful at each of those. I was like, "Oh, my goodness. You can be a driver and also a team owner and cross over so many different ways!" I love that. I want to do that. I've always been attracted to sports that have a very thin rulebook where you can design outside the box because the rules allowed it. Import drag racing was like that, drifting is like that, and that's what keeps me motivated.

PRI: Who else has influenced or inspired you?

Papadakis: We subleased space from AEM Electronics for a dozen years. I was friends with the CEO, Greg Neuwirth, and some of the management and employees. I noticed how a proper manufacturing business was run. If I had a question about running my own business, they were accessible, and I could go upstairs and have a conversation about business and really have some good mentoring in that way.

PRI: You have your own CNC and your own 3D printer. How did you get into that? Because unless I missed something, you were not formally trained to be an engineer.

Papadakis: Each year or so, I try to learn a new skill. With skills like CAD design, I was around people who were already experts in it, like the engineers at AEM or different

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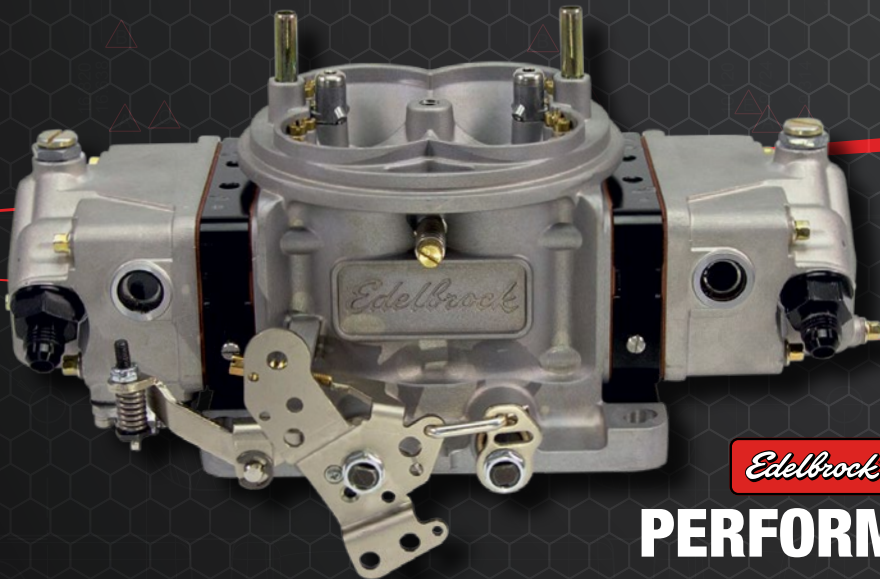
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friends who were actual degreed engineers. I said, "Well, I want to do that," so I just got the software like SolidWorks, and I'd watch some tutorials on YouTube, and I'd also get books and read up on it, and then just start doing it. If I'd get stuck, I would do research or call a friend. I'd get a little bit of input and go back and figure it out.

PRI: You got your start in drag racing. Do you think you might go back to that sport, and also, will you ever be the driver again?

Papadakis: I'm happy as a team owner, and I spend so much time on managing the team and building the cars, which I think I'm really good at. I think that there are drivers out there who are better than me at driving. In order for what we're building to get driven at the highest level, it's not necessarily going to be driven by me. Everybody on the team wants to extract the most out of whatever we're building, so we want to work with a driver who has the ability to do that. I like winning more than I like driving!

PRI: Where do you see motorsports changing in the next five to 10 years, whether that's in technology or in the business environment?

Papadakis: It's already happening, and some people are just realizing that it's happening. I think it's the interaction between the fans, the drivers, and the events. Where people would show up years ago and just



"We've always tried to build the most cutting-edge vehicles in our space and also to be on the front end of where people are getting their information," Stephan Papadakis said. The team generates content on its YouTube channel and has a robust social media presence, with more than 133,000 Instagram followers.



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“NETWORKING AND REPUTATION ARE AT LEAST AS IMPORTANT AS PERFORMANCE ON TRACK, BECAUSE AT THE END OF THE DAY, IT’S NOT JUST ABOUT WINNING, IT’S ABOUT PEOPLE WANTING TO RACE WITH YOU.”

buy a ticket and go in the grandstands and watch cars go around a track, now the fan is much more engaged. They’re following the drivers on social media. There’s much more content outside of just that weekend event that they can be in contact with and make comments and have discussions with other folks who are interested in the sport.

Because we create our own content, we answer our own fan comments. There’s much more of a connection there, and I think that the fan now and into the future appreciates that connection with the sport, the teams, and the drivers. That’s where we really pride ourselves in getting connected. We do it because we love it, and it shows through the content and our social media. We’re just like the people that watch it; we all love what we’re doing. I think that one of the reasons that drifting has increased in popularity is the accessibility of the teams, the drivers, and the whole sport.

PRI: If someone’s thinking they might want to form a team, whether in Formula Drift or anywhere else, what would be your advice to them? How can they be successful?

Papadakis: That’s the million-dollar question. I think number one would be to take on what you can complete, so be realistic about what you’re trying to achieve and whether you can do that with the resources you have. Then, networking and reputation are at least as important as performance on track, because at the end of the day, it’s not just about winning, it’s about people wanting to race with you. Most of the time is spent not racing.



When asked if he considered returning to the driver’s seat, Stephan Papadakis said he’s happy as a team owner, “managing the team and building the cars, which I think I’m really good at. I like winning more than I like driving!”

It’s working on cars, it’s communicating with people, it’s traveling with the team. There are so many aspects to motorsports and so much time in motorsports that’s not racing on the track, so make sure that you’re enjoying those parts.

PRI: You’re still young, so what’s left for you to achieve?

Papadakis: I am 45 and we’ve achieved a lot, and I really don’t have an answer! I think the real answer is I’m constantly working to be challenged in what we’re doing, and once it becomes too easy, which rarely happens, I’ll be looking around to see what else we can do that would be more challenging. I’m well past my performance trophy goals. I want to win a championship, but I chase enjoyment, and I enjoy being with friends and the people that I work with. If we can continue to do that, then that’s success and I’m enjoying my life. **PRI**



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GETTING

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Understanding the ins and outs of the California Air Resources Board certification process is essential for today's performance parts manufacturers.

By Steve Statham

No one ever claimed that the performance business was easy, and that's particularly true during these days of ever-tightening emissions control regulations. Aftermarket parts manufacturers not only service the pure racing market, but also the much larger street performance scene. A key to reaching the widest possible market includes securing emissions certification for parts from the California Air Resources Board (CARB). That CARB certification is the dividing line between a 49-state legal part and a 50-state legal part.

CARB certification is a complex subject, and one that parts manufacturers have been navigating for years. But it's worth taking a current read of the lay of the land, particularly with rule changes that have been implemented this year. After all, to say that attaining CARB certification for parts is a major focus of any aftermarket business plan is, frankly, an understatement.

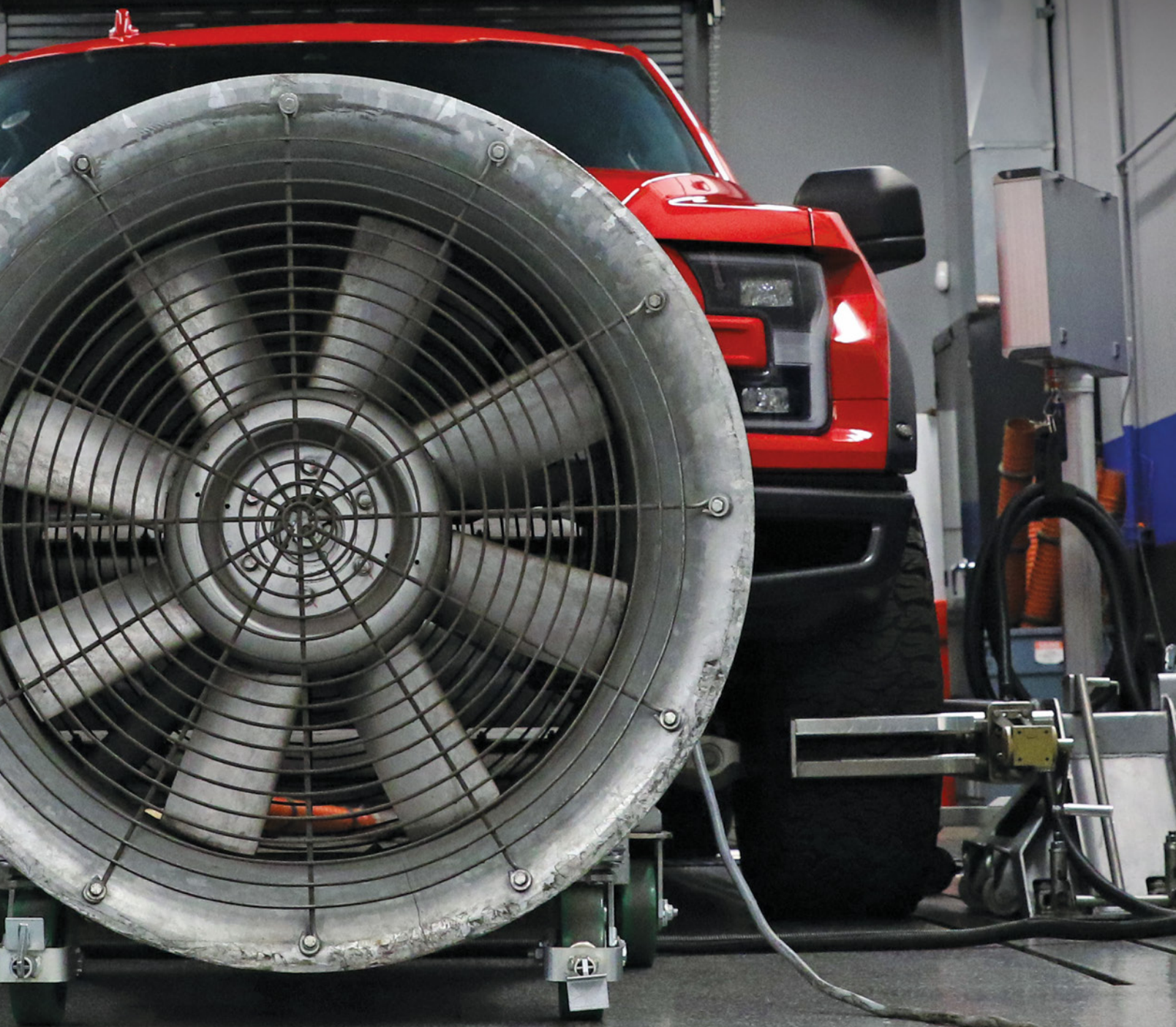
Gale Banks of Banks Power in Azusa, California, is one of the pioneers in getting aftermarket parts CARB-certified. Banks first worked with CARB in the late 1970s when Pontiac approached him about developing a dealer-installed turbocharger kit for the Sunbird. At the time, Banks said, CARB didn't yet have a procedure for approving aftermarket parts. He has watched the importance of the CARB Executive Order (EO) grow from the beginning.

"From a business standpoint, if you don't have an EO in California for a popular vehicle, that's 20% of your marketplace," Banks said. "The population of California is more than the population of Canada."

At K&N in Riverside, California, obtaining CARB EOs is a constant part of business. "We have a really good relationship with CARB right now," said Jonathan Fiello, chief engineering officer at K&N. "In terms of total number of Executive Orders, at K&N we lead the way—we have more than any other aftermarket company out there. That's a combination of K&N and our other brands.

"Every year is a little different, but in terms of part numbers, on average we typically go through 85–100 part numbers a year. Those part numbers then cover multiple applications," Fiello continued. "So we get anywhere from 500 in one year all the way up to 2,600 vehicle applications that go along with those 85–100 part numbers. We want the part numbers, so we want to cover as much as we can. In a good year, more than 2,000,

R B CERTIFIED





The SEMA Garage emissions lab can help manufacturers attain a SEMA-Certified designation for EPA 49-state emissions compliance, or the data necessary for CARB EO certification. It has the capability to conduct exhaust emissions testing but cannot test for evaporative emissions. "We have relationships with other test facilities that can do that," said our source at SEMA.

on an average year I'm looking at probably 1,200 to 1,500 applications."

ABCs OF CARB

To unpack the complexities of the CARB-certification process, it helps to step back and take a wider view. "There are two governing bodies that oversee emissions in the United States," said Peter Treydte, director of emissions compliance for SEMA, Diamond Bar, California. "There's the Environmental Protection Agency (EPA) that oversees the whole country, and in California there's the California Air Resources Board, which oversees air quality in the state. Because CARB was formed prior to the EPA, CARB has continued to be allowed to set tighter standards than the EPA does for the state of California."

The Clean Air Act was the federal legislation that set the stage in the 1960s for what was to come. There has been a steady progression of emissions-related requirements for vehicles, running from Positive Crankcase Ventilation (PCV) systems, to catalytic converters, to On-Board Diagnostics systems (OBD). The key issue for aftermarket parts makers is to show that their performance parts do not adversely affect emissions.

For California, that proof is expressed in the form of an Executive Order from the California Air Resources Board. "Under EPA law, which is nationwide, you have to have a reasonable basis that the part does not take the car out of its original compliance," said Daniel Ingber, vice president of government and legal affairs at PRI and SEMA. "Until very recently, the CARB EO was the best way to show that, even for EPA purposes. The EPA recognizes a California EO. Once you have a California EO you are 50-state legal. We advise all of our manufacturers that are making parts that go into the emissions system to get a California EO, generally."

Complicating matters is that the EPA has recently started interpreting the Clean Air Act in such a way that the very act of converting an emissions-compliant street car into a race-only vehicle could soon be essentially illegal.

"The RPM Act, which is currently in Congress, would clarify that you could convert a street car into a dedicated race vehicle," Ingber said. "The racers need to know that without the RPM Act, with the EPA's increased enforcement, with the EPA going after people who merely sell parts that could go on street vehicles but are made for dedicated racing, this creates a chill in

the marketplace. This is going to mean that the parts they want for racing these vehicles may not be available."

THE PROCESS

What goes on inside that Black Box of emissions certification for aftermarket parts? Frank Bohanan has run emissions labs for aftermarket companies and has worked as a consultant on the topic for many companies under his Brighton, Michigan-based GreenSpeed Automotive company.

"Before you even get the vehicle to the lab, you realistically have to start a dialog with CARB and say, 'Here's what I want to do.' And then they'll come back and give you a Test Letter," Bohanan said. "That Test Letter says exactly what you have to do. Sometimes they'll ask you to test a vehicle that's hard to get, and you have to negotiate with them to see if you can use a different vehicle instead. It could be something like they want you to test an F-350. Well, you can't find an F-350, so maybe you counter with an F-250 that's got the same powertrain and you dial up the weight on the dyno to make it think it's an F-350. Those are the kind of things you do to make the process a little more user friendly."

The SEMA Garage has an emissions lab that can help manufacturers attain a SEMA-Certified designation for EPA 49-state emissions compliance, or the necessary data for CARB EO certification. "There are two types of emissions that we typically have to be aware of," said SEMA's Treydte. "There are exhaust emissions, and that is what comes out of the tailpipe of the vehicle while it's running. And then there are evaporative emissions, and that's what comes off the vehicle when it is not running. Evaporative emissions regulations are only applicable to gasoline vehicles. Diesel vehicles are not subject to evaporative emission regulations. For those two types of emissions there are tests that are necessary to demonstrate emissions compliance in both those areas. At the SEMA Garage we don't do evaporative testing. We do have relationships with other test facilities that can do that. We do have the capability to do exhaust emissions testing.

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equipment in our Diamond Bar, California, SEMA Garage," he continued. "The equipment itself involves a chassis dynamometer with a 48-inch roll that offers good road simulations, and gas analyzers that measure the emissions that are coming out of the tailpipe.

"The required testing will vary depending on the vehicle type and the product type. In general, what we usually do is start with an OBD verification. That involves resetting the OBD system, essentially clearing the system so that all the monitors in the OBD system are incomplete. Then we do mileage accumulation with that vehicle to allow the OBD system to go through all of its processes. The intent of doing that is to demonstrate that the OBD system is not adversely affected by the product," Treydte added.

"Once that's complete, we then prep the vehicle for the chassis dyno testing. The prep process involves storing the vehicle in a controlled temperature and humidity



Our source at K&N said the company "leads the way" when it comes to the number of EO numbers it has obtained for its various brands. "We have a really good relationship with CARB right now," he added. Photo courtesy of K&N.

environment. We then drain the fuel from the vehicle and put a certification test fuel into the vehicle. Then it goes through a prep process on the dyno. That prep is intended to establish all the operating conditions for the vehicle to normalize it.

"After that prep is done, the vehicle

is kept in the controlled environment for a minimum of 12 hours and a maximum of 36 hours. We call that a 'soak period.' Following that soak period, the testing is performed. The first test we typically run is what's called Federal Test Procedure 75. The FTP-75 includes a cold start. If you can imagine the vehicle, having been stored in the controlled environment, will essentially be at room temperature when it starts that test. That means that the catalytic converter is not up to operating temperature yet. So we're capturing any emissions that would come out of the engine prior to the catalytic converter being at its operating temperature. That's part of that FTP process. The FTP-75 is a road simulation—it basically simulates city driving. The way I like to describe it is, it's as if you get in your car in the morning, you start it up, you pull out of your driveway, and you drive through town, hitting a few stop signs and signals there, a few stops and starts, and you're driving on city streets

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SEMA GARAGE EXPANDS

Helping members navigate the EO (Executive Order) process has long been a mission for SEMA. “A few years ago, SEMA surveyed the members and asked a few questions about emissions compliance. We asked what were the challenges or difficulties that our members were experiencing with emissions compliance,” said Peter Treydte, director of emissions compliance at SEMA. “It really came down to a handful of issues. One was that dealing with CARB was challenging. There was a lot of difficulty in understanding the regulations, and our members indicated they needed a source of information that would help to cut through the red tape. Secondly, our members were concerned that it was difficult to get time in the emissions laboratories to do the testing that was required. A lot of the emissions laboratories had historically been dedicated to OEM work, and that resulted in aftermarket manufacturers finding difficulty getting availability in laboratories. The third thing that kept coming up was the cost of doing testing. Some manufacturers found that when it came time to do the testing, the cost was prohibitive to their business model. So SEMA set about to address those three issues, and that’s what led to the formation of the SEMA Compliance Center.”

SEMA’s Diamond Bar, California, Garage has the necessary equipment for testing as part of the certification process, and SEMA is now adding a second location in Michigan that will also have all the state-of-the-art emissions measuring equipment. The second Garage, at 14655 Jib Street in Plymouth, will hold an open house in August. The lab will be operational sometime around November, “but we will have other services earlier than November, including some ADAS testing capabilities, and a handful of additional systems,” Treydte said. —*Steve Statham*



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where the speeds are nominal. The FTP-75 doesn't exceed roughly 52 mph. Then it's as if you went to the donut shop, you parked your vehicle and went in to get a donut for 10 minutes. There's a 10-minute wait period during two portions of the test. Then you get back in your car and finish your drive to work and park the car. That's the concept of what the FTP-75 is simulating. It's all a simulation of city driving," Treydte said.

"Then we have two other tests that would represent highway driving. Both of those tests can follow directly after the FTP test because they are hot-start tests. Those two tests are called the highway fuel economy test and the US06. And finally, there's another test that's often referred to as the air conditioning test. Its official name is the SC03 test, and that test is performed with the air conditioning active in the vehicle. The idea there is that the compressor is going to place additional load on the crankshaft of the engine, which could potentially affect



Certification testing requires the use of very accurate, precise, and costly equipment to measure emissions down to the parts-per-billion level, while particulate emissions are measured down to millionths of a gram. All this is done while using very specific, mandated procedures. Photo courtesy of GreenSpeed Automotive.

emissions output. The SC03 test is also a simulation of city driving speeds.

"The OBD verification portion of it is probably a one- to two-day process," Treydte explained. "In some cases, it can be longer than that. The prep takes about a day, then the testing itself takes about a day. We typically indicate it will take about



a week's worth of time to complete a full round of testing.

"Following that test process, we would compile that information into a report. That report is what is used either by the manufacturer of the product for their own internal purposes or could be submitted to CARB in the efforts to obtain a CARB EO.

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“A third option is, SEMA is starting its own certification program called SEMA Certified-Emissions (SC-E). We would use that same type of data and that same type of report process to issue our own certification for a product. SEMA Certified-Emissions is intended to specifically meet the requirements of the EPA. One thing that’s distinct between CARB and EPA is CARB offers a program for demonstrating emissions compliance, that’s the CARB EO program. EPA does not. So our purpose in developing the SEMA Certified-Emissions Program is to meet EPA’s requirements in the absence of a program that specifically does so,” Treydte said.

MISTAKES AND MISCONCEPTIONS

The CARB EO process has been in place for years, and most aftermarket parts companies have dealt with it at some level. Even so, there are common misconceptions

surrounding the process.

“Manufacturers should have a better understanding or respect for what the OEM catalytic converter achieves,” Treydte said. “The catalytic converter is the primary emissions control device on modern vehicles, and it is doing a significant amount of work to control emissions. There are a lot of assumptions that aftermarket catalytic converters are capable of achieving the same result, and in most cases I have found that that’s not true. Aftermarket catalytic converters, or what people assume to be high-performance catalytic converters, aren’t performing at the same level as the OEM catalyst.

“That initial minute to two minutes of vehicle operation during the FTP-75 is really pretty critical,” he continued. “If your product affects the ability of the catalyst to reach its operating temperature in a negative way, then you could find yourself affecting the results of that FTP-75 test. The other issue

is that there are assumptions made that aftermarket, or performance or high-flow catalytic converters, will do just as good a job as the OEM. I have yet to see test data that would support that claim.”

When it comes to enforcement actions against the industry, it’s important to remember that there is liability all up and down the chain—manufacturer, distributor, and retailer. Bohanan cautioned against simply labeling parts and thinking that is sufficient. “I would say probably the biggest single thing is, having a disclaimer that says, ‘Off-road Only’ or ‘Racing Use Only,’ doesn’t mean squat. You can put that all over on everything, but the bottom line is, what did you actually do? Did you actually take steps to ensure that your ‘racing parts’ are only sold to people who are actually racing? Or are you doing the ‘nudge, nudge, wink, wink,’ and if a guy comes in with a car with a license plate, you sell him a set of long-tube headers knowing that he’s

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going to take his catalytic converters off. And God forbid you should actually do the installation," Bohanan said. "It really comes down to, you have to make a good faith effort to walk the walk, so to speak."

Companies can protect themselves from allegations of illegally selling race parts for the street by documenting the sales process, but that also requires taking the whole idea of emissions compliance seriously.

"It can be everything from taking pictures of the vehicle to show that it's a race car with a tube frame chassis, to, if selling mail order, having a firewall where you get somebody to check a box that says, 'Yes, I am only using this for exempted use,'" Bohanan said. "People forget that if you get a car built prior to 1966 you can do pretty much whatever you want to it. It's not just racing use, it's racing and motorsports and other exempted uses, which also includes emergency vehicles, and stuff like that. But you have to basically show that they are



The emissions testing equipment at the SEMA Garage includes a chassis dynamometer with a 48-inch roll and gas analyzers to measure tailpipe emissions. Typically, it takes about a week to complete a full round of testing.

affirmatively attesting to the fact that they are going to do that.

"Now, even that doesn't get you out of the crosshairs, because then it goes to what we call 'the laugh test,'" Bohanan said. "The laugh test is, there were 50 vehicles in the

world that could use this part as a race part, and you've sold 5,000 of them. So you had to know, just by virtue of the fact that there aren't that many legitimate uses out there, you had to know that some of these are ending up on street cars."

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CHANGE IN THE AIR

With tightening emissions standards for new vehicles and a more aggressive environmental outlook by the Biden administration, the motorsports industry will need to adapt to the changing landscape.

"The regulations just changed as of January 1, 2022. They got a lot more specific than they had been for a number of years," Bohanan said. "Before, you could group a lot of things together and now you can't. Now you have to really break it down into much smaller pieces."

Some companies used to be able to get hundreds of part numbers on a single EO, but that's much harder to do now. That's ostensibly to make it easier for CARB engineers to go through the applications, Bohanan said. "The other thing is, conveniently, coincidentally, they're going to start charging for the applications now."

If attaining a CARB EO is more difficult than it used to be, it need not always be

an adversarial process. K&N has had productive meetings with the California Air Resources Board and has been able to present the industry's perspective. "I think this is always a very touchy topic, but it's also a topic people need to be educated about," Fiello said. "Some people make it out to be way more difficult than it really is, and then there are people who make it out to be so simple, which it's not either."

"I had the fortune two weeks ago to tour the new CARB facility, which is literally two miles down the road from us in Riverside," Fiello said. "We spent two or three hours with them talking about our experience and some of the challenges. One of the biggest challenges we're facing is just the cost of getting an EO has more than doubled for K&N because of the emissions standards and the testing that's required. I wanted them to see that because they didn't realize how expensive it had gotten, and they're willing to work with us now to

try to figure out ways to curb some of those costs. It was a really excellent meeting, and they're willing to help. They showed us the new facility and all the new test cells that they have for full SHED (sealed housing evaporative determination) tests. It's an amazing facility." **PRI**

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PRI 2022: MACHINERY ROW PREVIEW

CASE IN

Ever wonder how the equipment on Machinery Row can enhance your company's bottom line? Here, a half-dozen entrepreneurs reveal how machines that were featured in this popular PRI Trade Show destination boosted their shops' quality and productivity.

By Mike Magda

POINT

There's probably more drooling in and around the annual PRI Trade Show's Machinery Row than any other area of the Indiana Convention Center and Lucas Oil Stadium. High-end manufacturing equipment worth millions of dollars is on display, along with countless time-saving tools and replacement items like abrasives and cleaning supplies.

Machinery Row is also where solutions are found.

"One of the things that's really cool about PRI is if you have some problems in your business that you're trying to sort out, or you're trying to improve the throughput, you got all these guys there, showing you all the latest technology," said Dan Fitzmaurice of Zipper's Performance Products, Elkridge, Maryland. "We really like that part about the Show. I've been going to that Show for a long time, and I always bought a lot of tooling and things from it because it's always improved our business."

Dozens of companies fill the hallowed Machinery Row section of the Indiana Convention Center to showcase the newest machinery and update racers on new software, training opportunities, and support products for that equipment. The latest trends involving traditional metal fabrication and high-tech billet machining are also demonstrated.

In fact, the manufacturers enjoy the PRI Show for having access to customers with needs outside of racing. That is, the customer is a racer and is at the Show to improve vehicle performance; yet those same racers may need machinery, welding equipment, and supplies for their construction business or other trade. One exhibitor on Machinery Row at last year's Show hinted that 80% of his sales at that point in the Show were to operations outside of actual racing.

With a promise of that type of problem solving, Machinery Row at the 2022 PRI Trade Show should be more popular than ever. Following are several examples of how Machinery Row exhibitors worked with race shops in the past to solve their problems. Some of these stories came from direct sales at the Show, and others were from follow-up conversations and visits.

These stories reflect many of the current trends in the industry that racers are experiencing, especially on the labor front and sourcing either parts or services. Manufacturers are offering products that are more automated, allowing shop employees to concentrate on other areas of need. Also, these machines are easier to learn, and manufacturers are setting up comprehensive training programs to help bring newcomers to the industry. There are also exhibitors showcasing the latest in 3D printing, new measuring and scanning tools, updated CAD/CAM design software, and other high-tech solutions dedicated to racers.

Bottom line: There's a wealth of knowledge, experience, and skills available at Machinery Row to help solve just about any production and fabrication problems that a race shop might present.



Robins is one of many machinery manufacturers set to display their latest equipment at the 2022 PRI Trade Show. The company's GH 8 Super Precision valve guide honing machine was designed specifically for shops building small- to mid-size cylinder heads, as well as for high-volume engine rebuilders.



Don's Auto Parts and Machine Shop in Kenosha, Wisconsin, recently purchased a Serdi 4.5 seat-and-guide machine from RT Sales in Highland, Michigan. Adding this second Serdi machine to the shop will improve productivity, Tony Pontilla said, and enable him to hire more employees. Here, cylinder head tech specialist Hector Laracuente works on a head from a 410 winged sprint car engine.

SMOOTH OPERATOR

A noteworthy part of the work at Don's Auto Parts and Machine Shop in Kenosha, Wisconsin, is prepping GM 604 crate engines for competition at area dirt tracks. The recent addition of a Serdi 4.5 seat-and-guide machine that was purchased through RT Sales in Highland, Michigan, has provided two significant benefits for the shop.

"One is that business is very well off right now. We did not get rid of our old Serdi, so the idea was to expand and have two machines so we could have more employees," said Tony Pontilla. "The second benefit was, obviously, stepping up to a more automated product and a product that turned out much better work. We do about 40 604 crate engines a year that run in the non-winged IRA sprint cars. The ticket was just getting the valve jobs we wanted compared to the old machine. It gives us the ability to put in oversized valves and do custom multi-angle work."

Working with Russ Tierney at RT Sales provided an incentive for the sale. "With Russ, whenever there's a problem, he's even driven here to work it out," said Pontilla. "He's somebody who cares about what he does and goes out of his way to help you out.

That's why we deal with him and RT Sales."

Working with younger employees is another reason Pontilla likes the Serdi 4.5. He has a large shop with 20 fulltime employees and is eager to introduce machine work to the new workers.

"Training is something we had to do. With the automation on the 4.5, it makes it difficult for a new employee to make a large mistake," noted Pontilla. "All the dial

indicators and electronics make it a lot easier for a new person to understand what they're doing."

Finally, it's all about productivity when investing in new equipment. "Production-wise, a job that took us maybe two hours before, we can turn out with this machine in probably an hour or hour and 15 minutes. It's probably trimmed close to 50% off our times," said Pontilla.

NO ONE ELSE

"Long story short, I bought the machine because I can't get anybody else to do it for me."

That's Steve Morris talking about the arrival in January of a Centroid A560XL to his Muskegon, Michigan, shop, Steve Morris Engines.

"I can't get outside companies to do anything," continued Morris. "So I bought the machine to do it myself. Right now, we're making our own billet cylinder heads and, potentially, making our own billet blocks if we have to."

Morris has designed two V8 race engines, the SMX and SML, for high-powered drag and endurance racing. Both are constructed from billet aluminum. For example, a cylinder head will start out as a 105-pound chunk of aluminum, and after the Centroid is finished, there will be a 30-pound cylinder head.

The XL is the larger of the two A560



Steve Morris (not pictured) purchased a Centroid A560XL for his Muskegon, Michigan, engine building shop because he was having trouble finding an outside machine shop to do the work he needed. Today, he's not only machining his own billet aluminum heads, but is taking on outside fill work. "I can probably keep it busy 24/7," he said of his new Centroid.

systems available from Centroid.

"It's suited for customers with the intention of getting into a five-axis machining system to satisfy the need for CNC porting, engine-block machining, and for making other parts," said John Cowher of Centroid, Howard, Pennsylvania. "The system has been upgraded with high-torque 40-horsepower spindle, and 1,000 psi coolant through the spindle."

"Right now, it's staying busy on a continuous basis. We've taken on a little bit of fill work and doing a couple of programs for others," said Morris. "It's a mesmerizing machine, just standing there watching it."

Cowher said the turnkey elements available with the A560 series include necessary hardware, Mastercam software, digitizing software, probe, tooling, fixture plates, and a comprehensive training program.

"Centroid does a great job of training, and I ended up hiring a guy who was already trained in using the machines," said Morris.

"I can probably keep it running 24/7," Morris added.

BREAKING THROUGH A ROADBLOCK

As business was booming at Zipper's Performance Products, cylinder honing was a priority service that was falling behind.

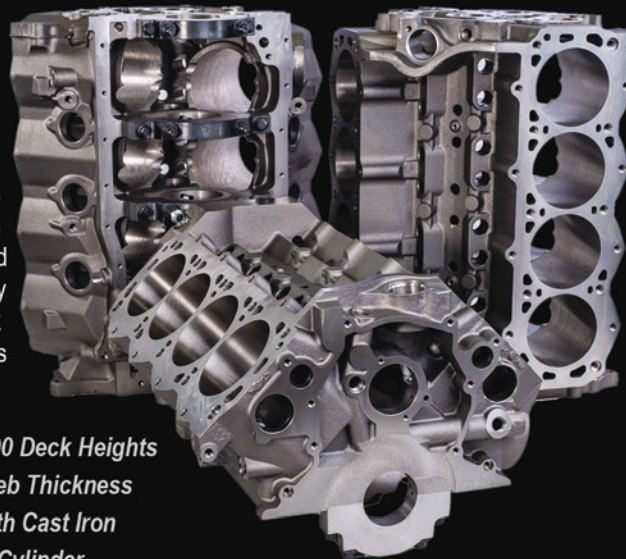
"Honing is like an art because it's a difficult process to do right," explained Fitzmaurice. "We have a double handicap in the motorcycle industry because we don't have blocks. We have air-cooled cylinders, and there is less structure to them than a conventional engine block provides."

Those cylinders can have odd shapes to fit in the crankcase, and they are known to flex during the honing process. Basically, it was taking too long to perform the honing operation on a 20-year-old machine and still meet the shop's quality standards. Fitzmaurice attended the PRI Show and discussed his problem with Bob Davis at Sunnen Products Company. Zipper's sent some samples and fixtures to Sunnen, which then put together a demonstration of the SV-30 at its St. Louis, Missouri, plant in March.

"The SV-30 is automated, so it moves

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Engine builder and machinist Justin Bender works the Sunnen SV-30 honing machine at Zipper's Performance Products in Elkridge, Maryland. The shop fabricated a dedicated fixture that holds motorcycle cylinders for the honing procedure.

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from cylinder to cylinder by itself," said Fitzmaurice, noting that the shop-made fixtures hold four cylinders at a time. "The other thing, it has the ability to hold even more parts with a different fixture."

Cylinder production almost doubled when the SV-30 was brought up to speed, and the shop is looking to the future when experienced technicians will be retiring.

"Remember what I said about honing being an art? I look back at all the years of honing on a conventional machine, even with diamond stones, and say that it's very art-like. This Sunnen machine takes a lot of that out," noted Fitzmaurice. "Now it's a task, and you just line up to do the work. It does what you ask it to do, very quickly and very precisely.

"My partner, we've been doing this stuff together since the beginning," continued Fitzmaurice. "I was wondering what we would do when he retires. I don't want him to be sitting in front of that machine for 10 years past retirement, just to precision hone liners. The SV-30 just does it!"

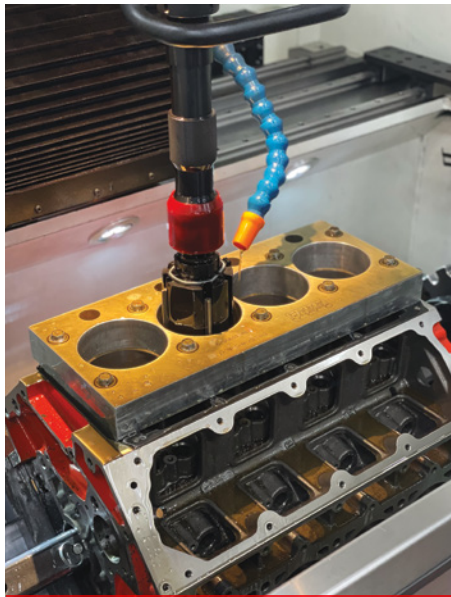
TIGHTEN UP THE SEAL

Baldwin Racing Engines in Friedheim, Missouri, offers a wide variety of performance engines, including those specially built for demolition derbies. Jeff Baldwin's previous cylinder honing machine provided the basics, yet he was looking for greater precision because cylinder seal was becoming more of a priority in competitive racing.

"The Rottler H85AX is probably the best piece we've bought to date, as far as a game-changer in the shop," said Baldwin. "It is so accurate. It produces such a round, straight hole with little to no influence on our end."

Baldwin noted that he can set up a block for honing while he trains a new employee on other equipment. "It runs all day long, and I don't have to worry about what it's doing," he said. "As long as you feed it the right information, it's so dead-on accurate."

Cylinder honing has become more critical in today's racing environment because sealing the cylinder is vital to building horsepower. Baldwin relies on diamond



Cylinder honing is critical in today's racing environment, which is why Baldwin Racing Engines in Friedheim, Missouri, purchased a Rottler H85AX honing machine. Jeff Baldwin called it "a game-changer in the shop. It runs all day long, and it's dead-on accurate."

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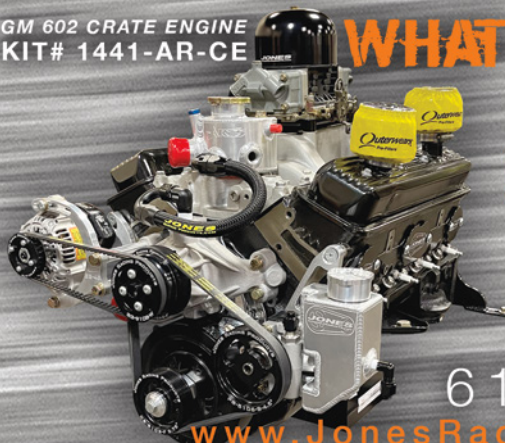


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honing stones and uses a profilometer to verify the results.

"The surface finishes that we can produce now versus what we were doing before are just so much better," said Baldwin. "Our valley depths and the Rpk, the Rvk, and all the measurements that the top shops are using now, we can produce and repeat it every time. We want to put more valley depth, and not that you couldn't do it before on other machines. But with that diamond being so rigid, it produces the same thing every time."

The consistency from cylinder to cylinder has impressed Baldwin, especially when file-fitting rings. He said the little difference in cylinder size can show up in the ring gap.

"I'm within a half-tenth to no more than a tenth variance from hole to hole, it's just so much better," he added. "It took 45 minutes of time savings just in file fitting the rings."

Finally, the speed and flexibility of the Rottler H85AX allows Baldwin to specialize in a wider range of engine applications. "Well, we're still heavily into the UMP modifieds,

Late Models, and demolition derby—those are still our most popular builds," he said. "But we do everything for street cars: a lot of Coyotes, LS, and Hemis."

BALANCE SHEET

Purchasing a crankshaft balancer from CWT Industries of Norcross, Georgia, allowed Jody Gunter Racing in Valley Mills, Texas, to expand the shop's services.

"Basically, this is a new venture," said Jody Gunter. "I was at the point of doing something new in my business. So, that's how it came about."

Gunter focuses on domestic engines with a slight preference toward Ford because he offers a performance cylinder head for big block Fords. He used to outsource the crankshaft balancing before purchasing the CWT 5500.

"I drove to Randy Neal's place in Atlanta to pick it up and take a crash course with him," explained Gunter. "I was very pleased with the training experience. I was very impressed with his facility. You know, you make a



Jody Gunter Racing in Valley Mills, Texas, used to outsource its crankshaft balancing, but Gunter found that many of his local machinists were retiring, with no one replacing them. "It's forced me to step in and do it," which is why he bought a Multi-Bal 5500 balancer from CWT Industries. He was pleased with the training he received and happy about the post-sale support he will get "since this is new for me."

purchase, and then you wonder maybe later if you did the right thing. I feel really good about the fact that they are going to be there to help me, since this is new for me.”

Balancing the engine's rotating assembly is somewhat of a black art. Engine builders have theories on overbalancing and underbalancing. Gunter had long observed a local engineering legend named Ted who balanced assemblies on an old Stewart Warner machine. When Gunter went for his training, Ted came along.

“I quizzed Ted on the way up there about overbalance, underbalance. We got to Randy's, and once we got to that discussion, it was pretty interesting,” recalled Gunter. “He has some very interesting theories. One thing that I did notice about Randy is, if he's got a theory, he's got a calculation behind it, and I like that.”

Gunter's work with the CWT balancer won't just be for engines built in his shop. He plans to take in outside work and grow that part of the business.

“The issue that I'm running into here, is that we're losing all of our local machine shops,” said Gunter. “The good ones are retiring, and nobody's stepping up to do it. What we have left, the quality just isn't great. So, it's forced me to step in and do it.”

SETTING THE TABLE

The Garage Shop in Catawba, North Carolina, used to have a 5x10-foot roll-around wooden table that was the community workbench.

“It looked like a dumpster pretty much all the time,” recalled Aaron Brown. “So I bought everyone in the shop a 3x4-foot welding table from Quantum.”

Quantum Machinery of Charlotte, North Carolina, is a distributor for Sigmund welding tables and fixtures, which are manufactured in Germany. They are available in different sizes and styles. The Garage Shop has purchased a total of 10 Series 16 Imperial tables that are constructed from hardened steel and treated to a plasma nitride finish. The tables can easily be connected to provide a large flat surface for special projects.

“Right now, we're building a Bonneville streamliner with a 280-inch wheelbase,” said

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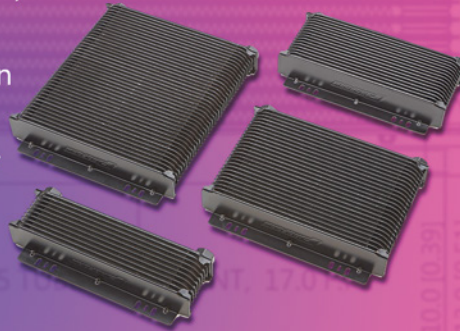


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The Siegmund welding tables distributed by Quantum Machinery of Charlotte, North Carolina, can be attached to form a platform long enough to build a dragster or a Bonneville streamliner. Here are the tables in use at The Garage Shop in Denver, North Carolina.

Brown. "The whole car is on tables now. They always give you a zero plane to work from. With them being gridded, you can do sideline measurements to make sure your chassis is center of the table. We actually made a body grid over the chassis. So while they're building the chassis, they know where the body sits."

The shop designed and built its own fixtures for the tables. "You can get as creative with those tables as you want," added Brown.

Other chassis projects at the shop include a pair of 1934 Ford roadsters that will run Bonneville and a new Pro Mod car that, ironically, will be used to test the engines designed for the streamliner.

"Our engine program for the streamliner runs supercharged Noonan Hemis. Steve Morris is doing all our engines for the streamliner," explained Brown. "So, we wanted a vehicle to go test our engines after the dyno and before we put them in the streamliner. We decided to build a Pro Mod car that we're going to run a mile and a half and basically test our streamliner engines in the Pro Mod car." **PRI**

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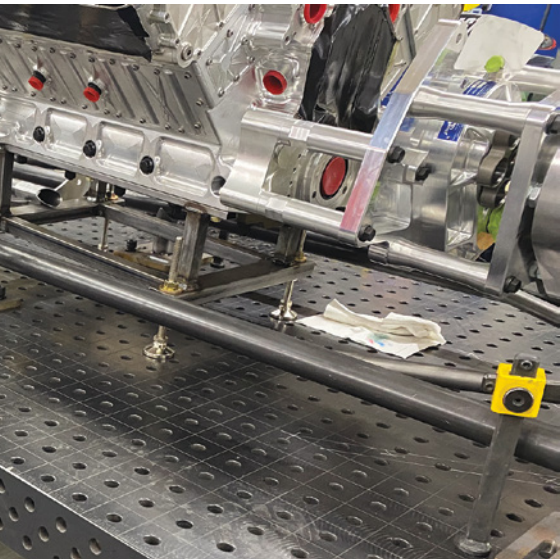
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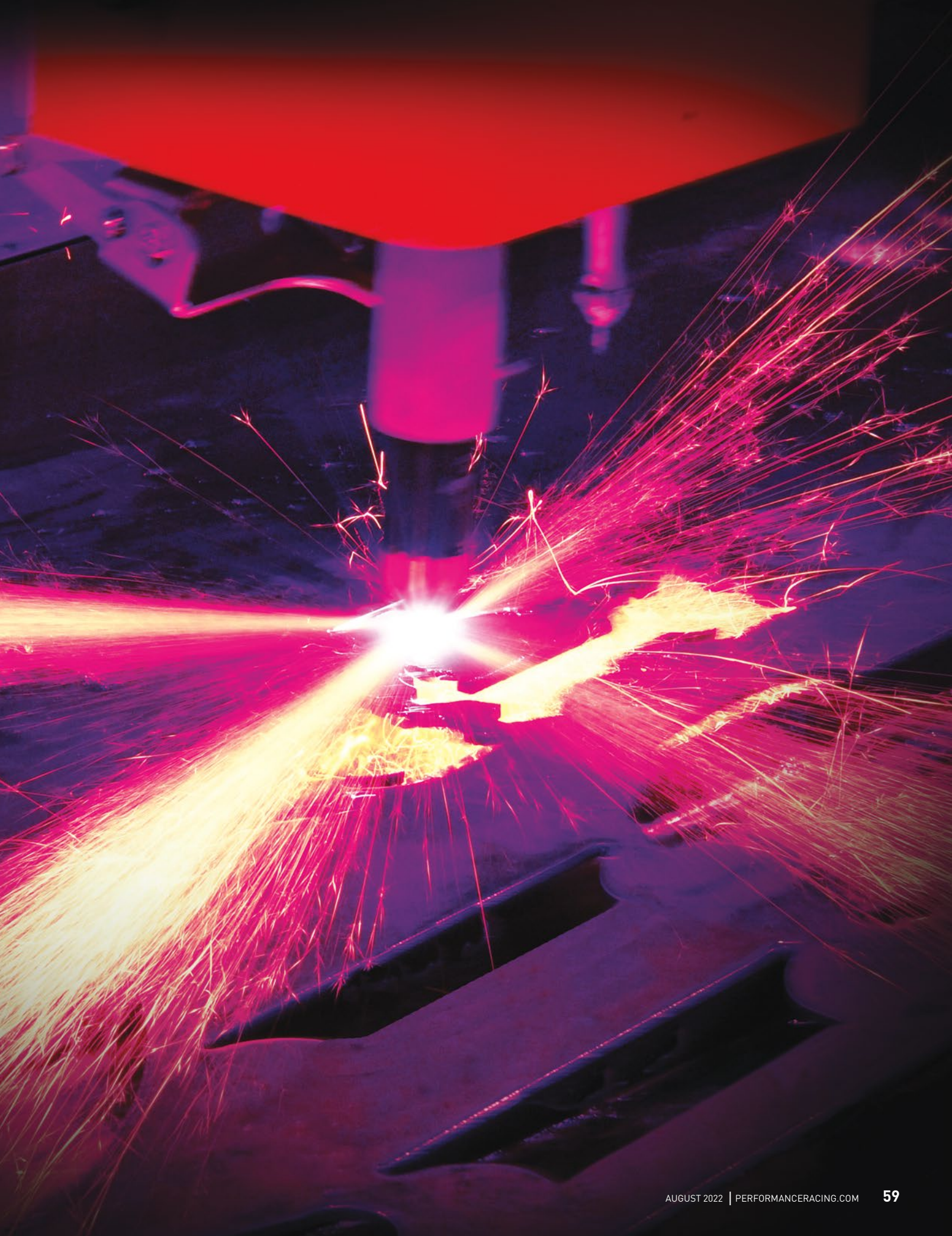
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AS SOME DRIVERS AGE OUT OF MOTORSPORTS AND MORE PLATFORMS BECOME TOO VALUABLE TO PUT ON TRACK, ORGANIZATIONS HAVE TURNED TO THE NEXT GENERATION OF COMPETITORS TO SHAPE THE LOOK AND FEEL OF VINTAGE RACING.

By Bradley Iger

Fueled by ongoing supply chain issues and pent-up demand, used car values have soared over the past two years. It has affected the accessibility of everything from Ford F-150s to Nissan 240Zs, and motorsports certainly hasn't been immune to the trend. Vintage racing has never been the most cost-effective way to get into motorsports, but as the market changes and a new crop of younger competitors looks to get more involved, vintage racing organizations are responding in turn.

"I think this trend has always existed to some extent," said Bernard Martin of the Pittsburgh Vintage Grand Prix (PVGP), Pittsburgh, Pennsylvania. "At some point, certain cars just get too valuable and too rare to race. And the owners of those cars eventually reach a point where they're too old to campaign them. Because of that,

"VINTAGE RACING HAS TO MOVE WITH THE TIMES; YOU HAVE TO KEEP BRINGING IN MORE MODERN PLATFORMS OR YOU'RE GOING TO LOSE MEMBERS."

vintage racing has always been in a constant state of transition to younger drivers and more modern platforms."

Recent years have seen notable changes in how these organizations go about attracting those new competitors, and everything from the marketing strategies to the definition of vintage has evolved as a result.

THE NEW GRID

"Folks don't want to race with a Porsche 962 that's now worth \$2 million," explained David Hinton of Historic Sportscar Racing (HSR) in Clearwater, Florida. "They'd rather buy an LMP3 car for a fraction of the price. Parts and support are much more readily available for them as well. So we've definitely seen more modern cars starting to infiltrate vintage racing over the past few years, whether that's retired IMSA prototypes or production-based GT cars like the BMW E46 3-Series and Porsche Cayman. Drivers who come into vintage racing tend to be primarily interested in the platforms that they grew up with and are familiar with, so the new generation isn't gravitating toward Triumph TR3s and MG Midgets. They're looking at cars like the Nissan 350Z and platforms like that. Vintage racing has to move with the times; you have to keep bringing in more modern platforms or you're going to lose members."



Pam Shatraw of the Sportscar Vintage Racing Association (SVRA) in Southlake, Texas, said that the SVRA has also seen an influx of newer cars as well as vintage production platforms that have become more desirable in recent years, like BMW 2002s, Datsun 510s, and older Nissan Zs. “B Sedan cars are really showing significant growth, and a lot more Japanese cars are coming onto the scene. Those cars are relevant to these drivers. They’re readily available, the heroes are still around, and the parts are relatively easy to get.”

Shatraw also pointed out that organizations like the SVRA have become a home to cars that formerly raced with groups like the Sports Car Club of America (SCCA), but now aren’t competitive by contemporary standards. “You see that with the Miata. We do an event in conjunction with Mazda called the Miata Heritage Cup with first- and second-generation cars. A lot of these cars went into barns after their time in SCCA racing was over, and they’re coming back out in the spirit of vintage racing for some very exciting races. There’s a lot of activity happening when you put 25 Miatas on a race track.”



Popular additions to the vintage racing scene are cars, like the first- and second-generation Mazda Miatas, that used to race with organizations such as the SCCA but aren't competitive anymore. "They're coming back out for some very exciting races," said one industry source.

Meanwhile, Jeanette Bourke of the Vintage Auto Racing Association (VARA) in Chino Hills, California, told us that VARA was looking

for ways to make wheel-to-wheel racing more accessible for young drivers, so the sanctioning body created a DTM class to

attract competitors in their 30s and 40s who are interested in campaigning cars like the E46 BMW M3, which now often run alongside old-school Corvettes and vintage single-seaters in mixed-class events. "That's the age group where we're seeing a lot of interest within our organization, so we wanted to find ways to support that," said Bourke.

In that same spirit, VARA also recently introduced hill climb events, which allow would-be participants to compete in street cars. The competitions are held four times a year on Willow Springs International Raceway's Horse Thief Mile track and follow a format similar to an autocross event, with racers sent up the course one at a time to compete for the fastest lap within their class.

"The drivers don't have to be members of VARA to come to these events, and they can race with basically whatever they show up with, provided it meets our safety standards," explained Bourke. "The idea here is to introduce vintage racing to a new group

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of people. Some of these kids in their 20s have never heard of vintage racing before. But there's a lightbulb that comes on when they think to themselves, 'Wait, I can bring my BMW out and race it?' They might not be able to afford a prepped race car right now, but maybe five years down the road they could be racing in wheel-to-wheel events with us. The hill climb events are bringing in an entirely new pool of drivers that was always there but hadn't been tapped before. These are the folks who would normally be

doing track days with Speed Ventures on the weekends, but now they're thinking about how they can get a car prepped for racing."

GETTING THE WORD OUT

The evolution of vintage racing isn't relegated to vehicle platforms and class

structures, though. Sanctioning bodies and vintage race event organizers are adjusting their outreach tactics to find these younger drivers through the modern information channels that they're already using every day.

"These kids aren't as interested in physical media as the generation before them—they're

New drivers entering vintage racing "are interested in the platforms they grew up with and are familiar with," said a source. That means they gravitate more toward BMW M3s and Porsche Caymans than Triumph TR3s or MG Midgets.



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finding what they need on their phones," said Hinton. "So we spend a lot of time and money making videos and sharing those through various social media platforms."

Bourke explained that while word of mouth continues to drive awareness, it's vital that

these organizations aim their marketing efforts where the intended demographic already is while also promoting a sense of community. "A lot of it is Instagram and Facebook, and some of our younger drivers are also racing with SCCA and NASA, and they're putting the

word out, too. We've also had the organizers of HPDEs [high-performance driving events] like Speed Ventures come out to our events to check out what we're doing, and RacingJunk.com has been a great tool for us as well. These are people on a budget who're already interested in performance driving and are looking for racing parts, so it's a natural fit."

For organizations like the Pittsburgh Vintage Grand Prix, getting young drivers involved in vintage racing tends to occur more organically. "For us it's become a



The SVRA is broadening exposure for vintage racing through its SpeedTour events, which combine vintage classes with series that have greater visibility, including Trans-Am. "Running these SpeedTour weekends offers a lot of different opportunities to bring awareness to the vintage events," said our source.

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generational thing,” said Martin. “At one point we had five generations of one family racing with us, and that sort of generational

connection is becoming more and more commonplace. Some of the onboarding also comes from the car show side. The Glace

family is a great example: Vaughn Glace is 20 years old and just won an SCCA national championship, and he also recently hopped

IMSA’S HISTORIC SPORTSCAR RACING ANGLE

Earlier this year, Clearwater, Florida-based Historic Sportscar Racing (HSR) was purchased by the International Motor Sports Association (IMSA) in Daytona Beach, Florida. With many of HSR’s past races already featuring a number of IMSA properties like Daytona International Speedway, Sebring International Raceway, and Michelin Raceway Road Atlanta, HSR’s David Hinton said the deal presents a great opportunity for both HSR and IMSA.

“IMSA has a huge amount of respect for its history, and this is a way to celebrate and protect that history,” Hinton explained. “As the modern race series continue to move in the direction of alternative-power vehicles, I think there’s going to be more and more interest in the vintage racing side of things in the years to come. At a certain point if you want to go hear a noisy race engine, you’re probably going to have to go to a vintage race.”

Since IMSA sister company International Speedway Corporation owns more than a dozen active race tracks in the United States, the acquisition also puts HSR in a favorable position when it comes time to plot out its race calendar. “That’s a huge help to me,” Hinton said. “There are so many different race groups out there looking for dates, and now we no longer have to fight off people trying to steal them from us. We’re only a couple of months into the new arrangement, and we’re already seeing the benefits of it.”

He also said that there’s a strong possibility that HSR racers will see more events on the calendar for 2023, and the series may also run some support races with IMSA as well. “Outside of that, IMSA doesn’t want to make too many changes over here. I think they’re taking the perspective of, ‘If it’s not broken, don’t try to fix it.’” —Bradley Iger

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in a car at the PVGP that he had never driven before, started in the back, and ended up winning the race. Obviously, his talents put him on those podiums, but where did that interest come from originally? Well, the Glace family has been involved with the Pittsburgh Vintage Grand Prix since the very beginning, and they originally connected with us through the car show side.”

For the SVRA, the outreach efforts extend to live-streamed events as well as its SpeedTour program, the latter of which connects its vintage races with series that have larger visibility. “There’s a lot of cross-exposure there,” said Shatraw. “Running these SpeedTour weekends offers a lot of different opportunities to bring awareness to the vintage events. Some of it is through CBS Sports’ television coverage of the event, but it’s also the people who are coming to these events to watch Trans-Am’s TA2 class racing and the teenagers competing in F4 who are climbing the ladder toward a career



Vintage racing “has always been in a constant state of transition to younger drivers and more modern platforms,” one source said, a trend that has accelerated as certain vintage race cars get too valuable or rare to race.

in professional motorsport. The breadth of what’s going on at these events helps to populate the fields at various levels.”

THE DIY APPROACH

As vintage racing continues to see this

shift toward more modern vehicle platforms as new drivers enter the mix, it’s also bringing a fresh approach to car preparation and racecraft. “The newer generation seems to be a lot more technically involved,” Hinton said. “They seem to spend a lot more time



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researching and figuring out how they can make the car faster themselves. I think there's a tendency with the older generation to say, 'Oh, that's just the way that car is—go drive it.' With these more modern cars, I think it's a lot easier to buy bolt-on goodies and get positive results on-track. They tend not to require quite the same amount of development that you see with the older cars."

That same approach also applies to these newer drivers' technique and the analysis of their races. "They all have their Go-Pros or some other way of filming their laps," Bourke said. "Some of them have lap timers and other telemetry equipment so they can really analyze their performance. But many of them are also learning that they've just got to get the seat time because the older drivers are still getting them in the corners."

Shatraw said that many of SVRA's younger drivers are getting that additional seat time virtually. "When you talk to these younger drivers, you often discover that they've

driven the track in a simulator or a video game to prepare themselves. They tend to do their homework, and it allows them to jump onto these courses that they may never have actually raced at before with some context for cornering speeds, braking points, and so on. They may never have actually been there before, but they can show up already having hours on that track."

Looking down the road, Shatraw added that while the vintage racing fields will always be in a state of change, some things will likely remain constant. "There are cars that will always be there—the muscle cars of the 1960s and 1970s in particular. And some classes will also become more niche, like the pre-war cars. Those cars will still be desirable, but over time there will be fewer people who know how to drive them. As we grow more toward the 1980s-era vehicles, I think we're going to see more and more Japanese cars in B Sedan because people who are in their 40s and 50s now can

connect with those cars."

That connection tends to be the core appeal of vintage racing. "The changes in vintage racing happen because it's mostly about people racing with the cars that they grew up watching," said Martin. "So it's a slow, steady progression. But it's always moving forward." **PRI**

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KEEPING THE

Those who maintain vintage race cars face some of the same challenges as contemporary speed shops—with the added complication of obsolete parts and decades-old equipment. Here's how these specialists keep those cars track-ready.

By Drew Hardin

In some ways, maintaining a vintage race car is like maintaining a contemporary race car. Ask Karl Wilen, whose RennsportKC in Grandview, Missouri, specializes in vintage Porsches, but who also serves as crew chief and engineer for PF Racing, a professional IMSA team in the Michelin Pilot Challenge series.

In general, he said, between-race maintenance is “pretty much the same whether we’re working on a modern car or an older car: Do a full nut-and-bolt of the entire car, before and after a weekend. Ultimately, you’re going through the whole car, tip-to-toe, at every event. All fluids are changed every event in addition to your mechanical items. We would rather change oils prematurely than have an engine or transmission failure due to oil breakdown. Cars are scaled to check alignment and corner balancing. Typically, we

will have different suspension settings for each track, so depending on the customer’s next event, those settings are changed to accommodate that track. That may include changes to shock settings, ride heights, corner balance, and camber/toe settings.”

Beyond that general plan, though, the two worlds diverge sharply. “We have to spend more time really inspecting the old aluminum components—wheel hubs, uprights, things like that, even the chassis themselves for stress cracking,” continued Wilen. “These cars are 40 years old, and the metals are starting to let go over time. Metal fatigues, so we really have to pay attention to those components more so than we would with modern day cars that use, say, a sealed wheel bearing in an upright. That’s just a much more solid component than an old 911 with a two-piece front-wheel bearing riding on a spindle



Photo courtesy
of Canepa

PAST ALIVE

that has been out there for 40 years.”

And, while parts shortages affect all forms of racing, they're greatly exacerbated on the vintage side. “With the vintage stuff, if you break something you might be able to find the part, but you also have to be really careful about what you're buying,” Wilen said. “That part may be 40 years old, too, so you have to inspect it well before you put it on the car. You can get a worn-out part just as easily as you can get a good one.”

Wilen was among a group of vintage race experts we recently spoke with to find out what it takes to keep historic vehicles in race trim during, and after, the season. Between them, their shops service the full spectrum of vintage racing machinery, from multimillion-dollar Porsche endurance racers to four-cylinder “momentum cars.”

DURING THE SEASON

“We have a standardized checklist that we go down after every event,” said Don Hoevel of Don Hoevel Racing, Fox Lake, Illinois. Hoevel specializes in Cobras, GT350s and other “Ford stuff,” he said, but also services “lots of Lotus stuff, sports racers, 2-liter sports cars, open wheel cars,

Formula B cars, and vintage Indy cars.” Like Wilen, Hoevel will “nut-and-bolt the car, check the brake pads, check the brake discs, charge the battery, do a fluid service if needed, or at least check the levels, check the tires, then do a parts inventory. Do we need pads, do we need tires, how much race fuel do we need for the next event? And then we clean the car. Our saying is, ‘The car has to leave the building a lot nicer than when it rolled in.’”

Keeping the car clean has benefits beyond the cosmetic. “We keep the inside of the fenders clean so we can see any indication of tires rubbing,” said Mitch Bressler of MSA Classics, Carrollton, Georgia. “Or, why is there grease on the back fender now? Do we have an axle seal leaking? Let's fix that.”

While Bressler is known as “the British guy,” and the cars serviced by MSA Classics are primarily vintage MGs and Austin-Healeys, he works on a wide range of cars, everything from an original Willys Jeep to late model Morgans. His clients are involved in road racing, circuit racing, and rallies. One client recently purchased a Winston Cup car, and Bressler is eager to get it into the workshop to see what magic he can work on it.



While MSA Classics builds engines to last two to three seasons, customers have started asking for annual post-season inspections, said Mitch Bressler. "They figure it doesn't cost that much, and they'd rather know what's going on," to catch small problems before they become bigger ones.

His maintenance philosophy is to keep his customers' cars "at the level they were when they started the season. We're looking at anything that's a fail point that we know of. But really, we build the car so that as much as possible is done during the offseason. That way, when we get to the track, we're just fixing problems as they come up. We try not to make a lot of changes throughout the season. But if we can see another second sitting over there, we're going to grab it, work on it, and make it happen."

The key to maintaining these cars is "catching the problem before it happens," Bressler added. "I'm sure you've heard this 100 times: We win the races in the shop; we don't win them on the track. I believe the will to win is not nearly as important as the will to prepare to win. And as prepared as we try to be, it's important to remember that these are vintage cars. Despite our best efforts, the unexpected can still happen—a bad wheel bearing, the gears seize, broken oil pumps, things that are fine one weekend and not good the next. We don't have a Magic 8 Ball here to tell when something is going to fail."

"My theory is, as soon as the race

is over, that's the time to do post-race maintenance on a car. Not wait until it's time to race it again," said Bruce Canepa. "After it completes a race weekend, look at everything in the car, evaluate everything in the car, figure out what it's going to need, and get the process started."

The vintage race cars in Canepa's shop in Scotts Valley, California, can run the gamut from a Porsche 917 to a Maserati Birdcage, Can Am cars, 1970s Trans-Am cars, and open wheel cars. "The common thing among

them is, they're all race cars," Canepa explained. "We have to understand what each one needs in terms of regular service and in terms of the things that can fail. Every car is different. They all have shortcomings somewhere. In the old days, a lot of the R&D was racing the cars. If they failed then, and someone hasn't changed it or re-engineered it, it's going to fail today at some point."

Understanding how to maintain a vintage race car "is understanding the life cycle of all the componentry in the car," Canepa said, "how it was used in the beginning, and how it's being used today." A car like the 917, for example, "was designed for endurance racing, 24-hour races, plus practices, qualifying, and everything else. So they're really designed to be 30-plus hour cars from a reliability standpoint." The engine in an endurance car can go "at least 50 hours" before rebuilding, Canepa said, "and if the driver's really good in terms of how he races and takes care of it, he might get 70 hours out of an engine without rebuilding it."

A Trans-Am car, on the other hand, "is reliable, but it's not designed to run a lot of hours. So a Trans-Am engine may need a rebuild in 20 hours, or 25 at the most." Plus, Canepa said, "we're checking clutches and suspension pieces because they wear out quicker than an endurance car. These cars

"The secret of a good [Porsche] 356 is having all the correct gears and utilizing them," said Vic Skirmants of 356 Enterprises, seen here working on a 356's transmission. It's not about all-out power, he said, but "having the right gears to let you use what you have."



While there's always a wide variety of vintage race cars being worked on at the Canepa shop, "the common thing among them is, they're all race cars," said Bruce Canepa. "We have to understand what each one needs in terms of regular service and in terms of the things that can fail."



are heavier. A '70s era Trans-Am car is a 3,250-pound car, and it's getting pounded pretty hard on the race track. We check a lot of mechanical things on that car because they just wear out faster. It'll go through more brake rotors, brake pads, etc. In period, it was designed to run only two hours or less in a race."

"As a general statement, the fancier and faster the car, the more maintenance it's going to need, usually requiring a professional level of support," said Vic Skirmants of 356 Enterprises, North Branch, Michigan. As his business name implies,

Skirmants works almost exclusively on Porsche 356s, cars he has raced since 1965.

"I've been with them my whole life, and to me it's about the most reliable car there is, unless the driver screws up. Once it's set up, a 356 doesn't require much maintenance. We're just checking tire pressures and checking the oil during race weekend." After the race,

Skirmants will perform a valve adjustment, a leak-down test, bleed the brakes, freshen the brake pads, and grease the front end. "Pretty minimal," he said. "If everything is in good shape, then there's nothing to repair, unless the guy has shoved it in the wrong gear at the wrong road speed. Then you get bent valves, broken lifters, all that kind of stuff."



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The cars at Michael's Vintage Racing get a "nut-and-bolt" inspection after every race, "but there are also areas where we try to make incremental improvements on the cars," said Michael Clifford Jr., at left.

There are certain maintenance tasks that apply to all cars, Skirmants said. "The car has to be set up correctly as far as corner weights and alignment, things like that." He also recommended making sure the brake fluid in the car is fresh and to use standard brake fluid, not fluid with silicone. "Race cars do not like silicone brake fluid, though nobody really understands why."

"MY THEORY IS, AS SOON AS THE RACE IS OVER, THAT'S THE TIME TO DO POST-RACE MAINTENANCE ON A CAR."

"As a baseline, every weekend after a race we do a nut-and-bolt inspection of the whole car," said Michael Clifford Jr. of Michael's Vintage Racing, which recently moved from New York to Scottsburg, Virginia. His is a second-generation shop, focused on the British sports cars his father worked on when he started the business in the 1990s.

Beyond the regular maintenance, "there are also areas where we try to make incremental improvements on the cars," Clifford said. As an example, he cited a customer's Ginetta. When Clifford was

moving the car, "I noticed the throttle travel was very long, so I made an adjustable modification to the linkage so we can adjust the quickness of throttle application. That will help the driver be a little bit more on top of the car."

POST-SEASON MAINTENANCE

For Wilen at RennsportKC, post-season maintenance means "a full teardown. We still follow our same protocols; we nut-and-bolt everything, but a couple of months of downtime gives us more time to send stuff out for rebuilding without being in a two-week crunch. We pull the shocks out, tear them down and test them, and if anything's leaking, we send them out for a rebuild. We typically replace wheel bearings once a year, that way rarely during the season do we have a bearing failure. We rebuild brake calipers, all that fun stuff."

At Hoevel's shop, post-season maintenance "depends on how many miles were done in the race season and how hard those miles actually were," he said. "At Road America, if you turn lap times of 2 minutes 18 seconds with some of these cars it's a huge strain, but if you're turning 2 minutes 30 seconds, you're not using the brakes up that hard, not overstraining the motor."

Typically, Hoevel will do an engine rebuild "every other year depending on the engine. Same with the gearbox. We'll pull the suspension off, crack-check the wishbones, crack-check the uprights, we'll even crack-

check the wheels. Fifty-year-old magnesium is not the safest thing to race on." For Can Am cars, which are built with an aluminum monocoque and have engines that can make north of 1,000 horsepower, "we'll look over the chassis. It twists and turns, and all of a sudden it starts loosening up rivets that hold the chassis together. We have to look at the rivets and make sure everything is still snug."

Skirmants, too, said post-season maintenance at 356 Enterprises depends on how hard the car was raced during the season. "If somebody hasn't used the car that much, the maintenance is pretty minimal. If the car was used quite a lot, you may want to pull the engine down, check everything out, wheel bearings, things of that nature."

"In the beginning, I was asked to build

Post-season maintenance at Don Hoevel Racing "depends on how many miles were done in the race season and how hard those miles actually were," Hoevel said.



cars to run two to three seasons,” said Bressler, so at MSA Classics, “we’d go two seasons or so before doing a major engine pull-down. But guys now, they want to do it every year. They figure it doesn’t cost that much, and they’d rather know what’s going on. Engines for one of these little British cars can be upwards of \$20,000, so the common-sense thing is, let’s spend a couple hundred dollars to take the engine apart and look at everything. Let’s catch that crank before it’s cracked, let’s get those rings replaced before they hit the cylinder wall.”

Beyond the engine compartment, “we won’t do a total tear down,” Bressler said, “but we’ll do wheel bearings, pull differentials out and check them, inspect the gearboxes, and try to be ahead of the curve so we can start next season and they won’t have to miss one or two races.”

“Since COVID-19, everything has slowed; shortages of technicians, parts, materials, freight delays. So as soon as you know when you’re going to run that car, get ready,” said Canepa. “If you’re going to run the car in August, address what needs to be done as

“AS A GENERAL STATEMENT, THE FANCIER AND FASTER THE CAR, THE MORE MAINTENANCE IT’S GOING TO NEED, USUALLY REQUIRING A PROFESSIONAL LEVEL OF SUPPORT.”

early in the year as possible. Make a list so you can get the car totally race prepared. Don’t try to get it ready with one week, or 30 days, or even two or three months to go, because you won’t find the parts. You can’t do it that fast.”

GOOD PARTS—AND HELP—ARE HARD TO FIND

Canepa’s comment about finding parts was a common concern among these shops.

“Parts availability can be a huge problem for me and my British cars,” said Bressler. “We’re getting to be a forgotten car. If I need a crankshaft, it’s going to be six months before I can get one versus in the old days when they were sitting on a shelf. That puts me in a position of, do I pull the trigger and buy five parts sitting on the shelf hoping I

can sell them, or risk saying, ‘Sorry customer, you can’t make the race because of this.’”

Clifford sees some relief in the parts supply chain because “some of the smaller volume manufacturers, like Ginetta and Lotus, didn’t want to manufacture all their own parts, so they would use parts from Fords, or Standard Triumphs, or something like that, which makes it easier than you would think to get a lot of the parts.”

But not all of the parts. He, like others we spoke to, has had a hard time finding brake pads (“I had to order brake pads from England, and the entire country’s stock was gone”), pistons, suspension pieces, “parts that are normally widely available are all backordered. We have to plan farther ahead than normal and carry more inventory than normal, so I have it when I need it.”

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"There are two challenges now," Canepa said. "It's parts availability and it's people. You can't hire enough people with experience to work on these old cars. That's our number-one problem. We can make parts, or we can figure out who can make the part for us if we can't. But I can't make a technician. There are just not enough people with the skill sets that these cars require. Experienced mechanics are our most valuable asset."

It's not as simple as bringing in a technician with contemporary race car experience, Canepa said. "New race cars are like new production road cars. The technicians just replace components. They know that certain parts time-out at a certain number of hours or miles, so for them maintenance is a process where they disassemble the car after it's raced, replace the components that they know are now timed-out, and put the car back together."

"With old race cars you not only don't have the parts to do that, but there also aren't any guidelines that say this gets replaced at 4,000 miles or that gets replaced at 50 hours," Canepa continued. "You have to be able to disassemble the part and know how to evaluate the part, whether it's a crack-check process or just a visual. This is old-school mechanical work. You need mechanics who have experience to do that, who can look at a part and say, 'Those gears are worn out,' or 'That bearing's bad,' or 'In my experience, these failed at this time for this reason.'"

"Trying to find people for the last five years has just been blindingly difficult," said Hoevel, who pointed out that the problem is being exacerbated by the changing definition of a "vintage" race car. "What used to be a vintage car was 25 years or older. Now you see two-, three-, five-year-old Porsches, LMP cars, and things like that. A lot of these modern cars have a lot more data systems and computer systems in them, so you need somebody who's computer literate for one, but also understands car systems and data systems so they can actually read the data and understand what they're reading."

CUSTOMER RELATIONS

Most of the customers these shops work with entrust their cars, the maintenance, transportation and even trackside support to



Bruce Canepa, owner of the Canepa shop, said his "number-one problem" is hiring qualified technicians with vintage race car experience. "This is old-school mechanical work, and you need mechanics with experience to do that."

the professionals.

"I have built my reputation for so long now everyone realizes, let me have the car, let me do my thing," said Wilen. "It's going to be reliable; it's going to be sorted, and we probably won't have to put much of a wrench on it during the weekend."

"A few of our customers tell us to go ahead and do what we think," said Clifford, "but none are completely separate from the process. They like to know what's happening and why. That's part of the enjoyment for them—and us—to collaborate about how to improve the car and why we're improving it the way we are. When the driver is informed about the changes we're making and why we're making them, they can use that information on track to tell us if it's working or not, or if there's something related that might need attention afterwards."

"I would think that's probably the case everywhere," he added, "because in vintage, the owners are here for one reason: they're enthusiasts. I'm sure there are a few that just like to just get in the car and drive, but a lot of them are really in love with the whole experience."

"We have a great deal of interaction with our clients," said Bressler. "We look at our business as being in partnership with our race drivers. Winning races is a package

deal. The workshop and the driver work together to make the best decisions for their car. It's the driver's skill on the track that shows the quality and ingenuity of what we do in the workshop."

"I want it to be an enjoyable experience," he said. "I want them to get their money's worth. These guys are spending upwards of \$7,000–\$8,000 a weekend, between entry fees, towing, fuel and tires and everything else. I want them to be able to do the whole weekend instead of one lap and done." **PRI**

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Time Marches On



While great care is taken to capture the look and feel of these old-school race cars, a peek underneath the bodywork reveals a range of modern solutions that have contributed to improvements in safety and performance.

By Bradley Iger

Aesthetics play a particularly crucial role in Nostalgia drag racing, and capturing the vibe of renowned machines from decades past goes beyond recognizable liveries and iconic match-ups. Period-correct powertrains, wheel styles, and even suspension setups often play important roles in the quest to capture the essence of these well-known cars and drivers.

Yet at the same time the march of time has introduced opportunities to improve these cars' durability, performance, and safety while retaining the qualities that make the homage recognizable. Meanwhile, other factors—like the skyrocketing values of original vintage parts—have convinced many Nostalgia series organizers to take an increasingly pragmatic approach to their rule sets in order to ensure that competitors can continue to participate. That, in turn, is bringing more

contemporary hardware into the fold.

"There's a lot of technology being used in terms of data acquisition and things like that," said Mike Rice of the NHRA Hot Rod Heritage Racing Series, Glendora, California. "Everything evolves, so we're under a constant barrage of new products, and we're always considering whether something makes sense for the spirit of the rule or not. We've definitely seen new equipment come in that made a lot of sense to allow here. In everything from Top Fuel down to the bracket

classes, the racers regularly come to us and say, 'Hey, would this be legal?' We basically evaluate those on a case-by-case basis. We try to keep things as original as we can, but it's a balancing act."

Given that, we wanted to get a better sense of how organizers in Nostalgia drag racing are achieving that balance by digging into the specifics of the types of products that are, and are not, allowed in these series.

MIDWEST NOSTALGIA PRO STOCK ASSOCIATION

Mike Ruth told us that the goal of the Midwest Nostalgia Pro Stock Association (MWNPSA) in Chicago, Illinois, is to keep the cars as period-correct as possible, but there are areas of the car where modern improvements are a necessity. "Let's use my car—the Glidden car—as an example. When Bob raced back in the day, he didn't have a Funny Car cage and a lot of the other stuff that we put on there for safety. Some of it just didn't exist back then. We do a lot of NHRA events, and they tech us just like anybody else. So first and foremost they have to meet the SFI spec and the NHRA's safety criteria to even go down the race track."

Ruth explained that in the early days of Nostalgia Pro Stock, many were racing with

the actual original cars, but eventually those machines became too valuable to continue to race. The problem was compounded by the fact that the cars also needed to be modified in order to maintain modern levels of safety, and no one wanted to do that.

He pointed out that it's ultimately about paying tribute to the legends more than anything else. "We're entertainers. It's not about setting records; it's about putting on a good show," Ruth explained. At the same time, he also noted that all of the cars running in the series are as quick or quicker than the original cars that they're based on, and some of that performance comes down to the changes that competitors have been allowed to make versus the original car's setup.

"Longevity is your friend," Ruth said. "We get paid to go down the race track, and if the car breaks, it doesn't matter how fast you are. So we build engines that are larger displacement than the originals just so we don't have to beat them up as much and rev them really high. That has helped. A lot of folks have more modern suspension components on their cars. As a spectator, you're not really going to be able to see that unless you crawl underneath the car."

It's pretty much anything goes aside from

a few rules of thumb when it comes to engine setups. "We try to stick to conventional-style heads, and the engine needs to be aligned with the car manufacturer—a Ford in a Ford, etc.," Ruth explained. "But as long as it appears to be a Pro Stock engine, it's usually fine otherwise."

Although the series does not allow EFI or power adders, data acquisition systems are fair game. "These systems allow you to resolve problems quickly instead of trying to guess," he said. "And in terms of consistency, the data helps tremendously. The cars are running in the mid-seven-second range, so they're a handful—especially with a clutch. So these systems have a lot of benefits for tuning. We just try to hide them so they're not in plain sight. Between newer engine components, the data logging, the modern suspension setups, and the tires, the cars are getting faster and faster."

As the series continues to expand its ranks, Ruth expects the landscape of MWNPSA racing to evolve in the coming years. "I've seen it grow from half-a-dozen cars to hundreds of cars all over the country. As older guys retire and younger guys come in, eventually we're going to see things like Erica Enders and Jason Line clone cars. We're not there yet. But 10 years from now we probably will be."

NOSTALGIA GASSERS RACING ASSOCIATION

A gasser's distinct look has always been a significant part of its charm, so it makes sense for a gasser Nostalgia series to really sweat the details on that front. But organizers must also contend with the realities of the marketplace. "I think a lot of associations have backed down on the rules a bit," said Bryan Huffman of Nostalgia Gassers Racing Association (NGRA), Kewanee, Illinois. "They were getting too fussy. They wanted racers to use parts that just weren't really available anymore, and that was driving the costs up. Some of the wheels, for instance, became really hard to get. So now we're seeing more aluminum slotted wheels, Cragars, anything that would still be considered period-correct."

Modern safety equipment has entered the mix as well. "The old stuff just isn't as



Cars running in the Midwest Nostalgia Pro Stock Association are as quick, if not quicker, than the original cars they're based on, due in part to some of the changes allowed by race organizers. Larger engines—so they don't have to work as hard—and modern suspension components improve both performance and durability.



The guidelines established by the Nostalgia Gassers Racing Association focus on safety, as the cars “keep running faster,” said our source. They also prioritize the gasser’s iconic look, “making sure that the nose height, the wheels, and the tire sizes are correct for the period.”

safe as what we have now. There were no engine diapers back in the day, and that’s an important rule for our organization. We don’t want to risk an engine failure getting oil on the tires as the car is going down the track. These cars keep getting faster, so safety is a huge priority for us.”

NGRA’s other guidelines tend to focus on the look of the cars more than anything else, and that plays into the equipment that these racers are using. “That’s the biggest thing, making sure that the nose height, the wheels, and the tire sizes are correct for the period is what we really focus on,” Huffman said. “We allow modern ignition systems and stuff like that, but we don’t allow things like modern EFI, turbochargers, and modern-style superchargers. But we do allow methanol and the types of superchargers that they were running in the 1960s and 1970s. What’s inside these engines is totally up to the racers.”

The series also has some leniency on front suspension setups, provided the nose of the car maintains that gasser appearance. “We like the straight axle cars, but we also allow folks to run independent front suspension setups because there were a number of gassers with independent front ends back in the 1960s. Those more modern setups also make it easier to run a more modern brake system.” The series doesn’t allow racers to

run independent rear suspension setups, but anything goes in the realm of solid axles.

NGRA rules prohibit stretched wheelbase and full-tube-chassis cars, but with the series competing at IHRA and NHRA tracks, the cars must meet the chassis standards for their respective ETs as in any other series. “The typical ET in our series is between 9.50 and 10.50,” Huffman noted. “So the chassis has to meet the requirements at those tracks. When it comes to safety, our drivers tend to understand that it isn’t in their best interest to do the bare minimum.”

NOSTALGIA SUPER STOCK

While appearance is also key for Nostalgia Super Stock in Springfield, Illinois, Mike Singleton said that the organization’s heads-up match racing format tends to encourage some friendly rivalries that are pushing the cars to new levels. “If we didn’t evolve with the technology, we wouldn’t be going as fast as we are. We have more 8-second cars than any other Nostalgia Super Stock club in the country. And that’s a lot faster than these cars were running back in the day.”

The approach for the series is often aimed toward using old school hardware that’s been improved with modern technology. “If you were to look at the engine in my car and compare it to a current Hemi Super Stock,



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Nostalgia Super Stock's heads-up match-racing format encourages friendly rivalries that push these cars to new levels. "We have more eight-second cars than any other Nostalgia Super Stock club in the country," said our source.

there's not much of a difference," he said. "For instance, I'm not running iron heads—I'm running Stage V aluminum heads, and I run an aluminum block as well."

The series guidelines call for an engine block based on what would have been in the original car, period-correct carburetors, and no power adders, but the rules are pretty flexible when it comes to engine internals. "You can't come in with a 5-inch bore space that allows for gigantic displacement, or something like that. It basically just needs to follow the original essence of the engine to a degree."

He added that the series has allowed mechanical fuel injection to be used in some instances, too. "It's often subject to the membership of the club in terms of what gets allowed and what doesn't."

The series allows competitors to do more or less what they please with the suspension systems, but full tube chassis aren't allowed outside of the AFX class, tire width is limited to 10.5 inches, and the safety elements must meet the current NHRA standards for the ETs that a given car is capable of. "We aren't super strict about the wheels, though" he added. "It would be pretty hard to get wheels from that time period today. But we do run some events where you have to have period-correct wheels, or they won't let you run. In those instances, we typically just look for re-creations that mimic what they were running back then."

As with an increasing number of Nostalgia series, Nostalgia Super Stock is onboard with data acquisition. "It's extremely hard to tune these cars without the data," said Singleton. "And when you're starting to run in the eight-second range, you're also looking for data that's going to tell you whether or not something's going on that could hurt the motor on the next run. Some racers are also monitoring shocks and things like that, too. The heads-up format tends to incentivize making these cars as quick as they can be."

NHRA HOT ROD HERITAGE RACING SERIES

With the NHRA Hot Rod Heritage Racing Series spanning across 11 different



The NHRA Hot Rod Heritage Racing Series allows racers to use modern engine and drivetrain components. "It's mostly about keeping the look right," said our source, "but the fundamentals need to follow what racers were using during a given era. We want the car to look right from 100 feet away."

classes that range from pre-1986 street cars to Top Fuel dragsters, Rice said that the appearance of the cars tends to be one of the biggest areas of common focus when it comes to the Nostalgia rule set. "There's not many parts that a racer could have run back in the 1960s or the 1970s that would still apply to some of these cars. It's mostly about keeping the look right, so we have a lot of rules about the bodies that they can run and things like that, and we're slowly moving the body years forward to stay in step with the audience as it evolves. What a 70-year-old considers to be Nostalgia can be very different from what a 30-year-old thinks is Nostalgia."

The series allows racers to use modern components in terms of engine and drivetrain combinations, but the fundamentals need to follow what racers were using during a given era. "So they might be using billet parts and things like that, but you're not going to see any screw-type superchargers, for example, and certain types of fuel pumps in some classes," he said. "We're trying to keep the costs under control, and we want the car to look right from a hundred feet away."

The specifics tend to vary from class to class, though. "Top Fuel classes are going to have aftermarket blocks, but most of the other classes are going to be more conventional aluminum blocks. They're going to be a little bit different as compared to an original Chevy 454, but it's going to follow that same basic size

and design.”

The safety rules follow the NHRA's standard guidelines based on ETs, which range from a helmet and seat belt in anything that's running 13.99 or above to certified rollcages, five-point harnesses, fire suits, driveline loops, and SFI-rated bellhousings and other protective measures for anything quicker than 9.99.

While the nostalgic look tends to be a focal point for the Hot Rod Heritage Racing Series, Rice pointed out that there's some flexibility in that area for most classes as well. "In Nostalgia Funny Car, for example, there's a lot of leeway in terms of what they can do to the bodies. A '75 Trans Am just more or less needs to retain that '70s Funny Car look. For the door cars there's even more flexibility—the only limits are on wheelbase and that kind of thing. Body-wise, they can pretty much make any modifications that they want.”

Rice said that he doesn't foresee any major changes coming to the series over the next few years, but he does expect ongoing tweaks to help shape the landscape of the Hot Rod Heritage Racing Series as time goes on. "The biggest thing for us is that they look correct. And we'll adjust body year limitations as we go forward. We're thinking that 35 years old is what most people would consider to be a Nostalgia vehicle.” **PRI**

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Photo courtesy of Chris Graves / Jim Murphy's WW2 Front Engine Dragster team



BUSINESS PROFILE

NEIL & PARKS RACING ENTERPRISES

Over the past 42 years, Neil & Parks has evolved from a humble chassis shop to a manufacturer of nearly every component one would need in order to put a Nostalgia Top Fuel or Jr. Fuel dragster on track. Owned and operated by the father-and-son team of Frank and Scott Parks, the shop's ability to design and produce a wide variety of high-quality one-off parts has made it the go-to option for both domestic and international racers.

By Bradley Iger

Growing up during the golden era of hot rodding, Frank Parks was interested in going fast from an early age. When he couldn't afford to pay shops to hop up his projects, he learned to do the work himself, and that approach would eventually lead to a career in fabrication.

"I think the shop kind of started as more of a tax dodge for my dad," quipped Scott Parks. "Norman Neil—the 'Neil' part of the shop's name—was a customer of his back in 1975 when they partnered up on a race car. The business didn't get started in an official capacity until 1980."

He explained that his father was frustrated with the arrangement he had with the fabrication shop that he was working for at the time, so he decided to strike out on his own. "My mom was working at that point, and she was making enough to feed us and put a roof over our heads. My dad basically said,

"Give me six months—if it doesn't make money, I'll go get another job."

The gamble paid off. Originally located in Salt Lake City, Utah, the shop moved to its current Burlingame, Kansas-based facility in 1993, and the relocation brought with it more than just a change of address. "Norm didn't want to move," Scott said. "He had a day job and was doing the tin work on the dragsters at night, but he'd recently gotten married and was kind of losing interest in the race cars. So we parted ways amicably."

Although the elder Parks' focus was initially on chassis work, over time he began to see a need to expand the company's products and services. "During the 1980s and 1990s, basically the only people who made anything for these types of dragsters were the original guys from way back when," Scott said. "The racing supply companies



From its roots as a car builder, Neil & Parks Racing Enterprises has evolved to a point where manufacturing products is now the top priority. “We are so busy making parts,” said Scott Parks, “there just aren’t enough hours in the day.”

hadn’t changed hands yet. But they got older and started to retire, and eventually we reached a point where it started to become really hard to get the parts we needed to build the cars. Fortunately, it didn’t all happen at once, and that allowed us to slowly step into the manufacturing side of things.”

They started with air bottle clamps, but it wasn’t long before Frank Parks began to explore what other racing products could be produced in-house. “I suppose it wasn’t that we couldn’t get them, it was that we couldn’t get what we wanted,” Scott recalled. “The ones that were available were poorly made, or they were the wrong size—they just didn’t meet our standard. And it seemed like every time we turned around, something that we normally sourced from someone else just wasn’t available anymore.”

The company began adding products to the catalog little by little, and a few years ago it reached a point where manufacturing had taken top priority. “We don’t really have time to build cars anymore,” Scott said. “We are so busy making parts; there just aren’t enough hours in the day.”

SPECIALIZED PARTS FOR SPECIALIZED RACING

Although Scott noted that Neil & Parks Racing Enterprises generally does whatever work comes in the door, the vast majority of his customers are looking for something that they can’t get anywhere else. “I don’t want to build 600 Super Comp cars, where the only difference between one car and the next is

the paint scheme. That’s not what we do. If you need a one-off part made, that’s where we come in.”

He also pointed out that the company’s focus on the Nostalgia market came out of necessity more than anything else. “Some of that comes down to the fact that we’ve been around forever, so we tend to know what we’re doing. We raced in this segment for many years and won a number of championships, so that kept us close to that community of racers and ensured that we stayed on top of what was going on in the series. Because we’ve built a lot of the Nostalgia cars, we ended up designing and producing a lot of products that are specific to those cars that you just can’t get from other places.”

He noted that Heartland Motorsports Park in Topeka, Kansas, is the closest race track

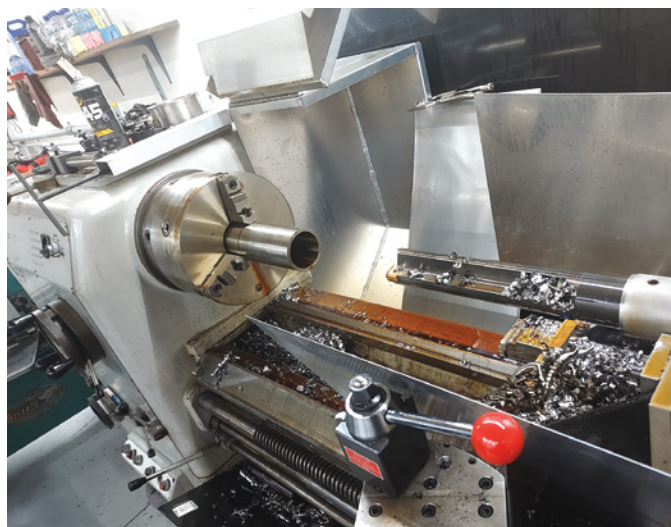
to the shop, but since Heartland doesn’t host a Nostalgia series, Tulsa Raceway Park—about 250 miles south of Burlingame—would actually be more appropriate to consider their “home” track.

“Since we’re working with customers all over the world, we don’t really need to be ‘local’ to any particular track. With products like these, I don’t think our location relative to the tracks that are supporting this kind of racing is a huge factor. It’s not like you can just go to your local shop and get this kind of work done.”

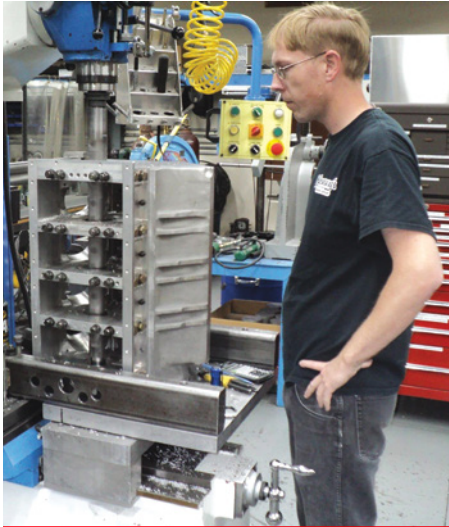
TOOLS OF THE TRADE

The Neil & Parks facility consists of a main, 6,800-square-foot shop and a second, 1,500-square-foot building that originally housed the team’s race cars but was eventually converted to allow for additional manufacturing capability.

“It was a situation where we’d retired from racing, and at the same time, there were just more and more products that were getting hard to find,” Scott said. “We started putting machinery out in that secondary shop because our gun drilling guy wanted to retire, and that’s where we had the space. We make some titanium driveshafts, and you can’t find titanium tubing that big and at the required thickness, so we went out and bought a huge lathe to build a gun drill. The other one that takes up a lot of space in that building is the horizontal boring mill. If you use your imagination, there’s almost no limit to what you can do with one of



Neil & Parks Racing Enterprises designs and manufactures everything from cylinder heads and billet pistons to wheelie bars and aero parts entirely in-house. Among its equipment are three manual engine lathes, a Bridgeport mill, a CNC lathe, a CNC mill, a tracer mill, a water jet cutter, and a modified keyseater.



Although Neil & Parks Racing Enterprises has had an employee or two over the years, the company is largely run by Frank and Scott Parks. "It's tough to find people to do this kind of custom work," noted Scott, pictured here.

those. Just last week someone sent me a rearend housing with an older version of Mark Williams' floaters on it. It had broken a spindle, and Mark won't make parts for his old floaters, so we decided to put that rearend up on the mill, cut the old spindles out of it, and then put our floater assembly in it, something that he can still buy parts for."

The only work that Neil & Parks regularly farms out is painting and anodizing, and that makes it a one-stop shop for just about anything a Nostalgia racer might need. The company designs and manufactures everything from cylinder heads and billet pistons to wheelie bars and aero parts entirely in-house, and that's led to Parks amassing a roster of manufacturing and machining equipment that includes three manual engine lathes, a Bridgeport mill, a CNC lathe, a CNC mill, a tracer mill, a water jet cutter, and a modified keyseater that Scott uses to make internal splines for spools and couplers.

"We also offer a chassis builder training class," he pointed out. "For \$500 a day someone can come here and use all of our equipment and knowledge to build a car. Right now, that's about as close as we come to chassis building. I'm not going to say I

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Pictured here are Neil & Parks Racing Enterprises' customer Jim Murphy (holding trophy) and crew after winning the 2017 NHRA Hot Rod Heritage Nostalgia Top Fuel title in Murphy's WW2 front engine dragster.



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would never build another one, but it's not work that we're actively looking for at the moment."

KEEPING IT SIMPLE

Although Neil & Parks has had an employee or two over the years, the company has largely been operated solely by Frank and Scott. "It's tough to find people to do this kind of custom work," he said. "Even now with all the parts we're manufacturing, yeah, it's production, but these are small batches. A couple hundred fuel tank caps and butterfly steering wheels will last us a year or two. There's just a finite number of dragsters in the world."

While the operation remains relatively small, it's not for lack of demand. "We do basically no marketing and we're buried," Scott said. "I think the closest we get to that is our posts on Facebook. Usually, I'll post something when we complete a project that's kind of unusual—something that people haven't seen before."

Neil & Parks customer Mike Botai told us that when he started asking friends for recommendations for shops that could help out with a build for the NHRA Hot Rod Heritage Racing Series, the company's



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reputation preceded them. "I think what really caught my attention about the shop is that they really do just about everything in-house, and the quality is just incredible," Botai said. "Initially, Frank helped me purchase an Alan Johnson motor, and I was just going to have them go through it and get it ready for the 7.0 Pro class. But I realized along the way that A/Fuel was really where I wanted to end up, and Frank happened to have a chassis available that was partially completed. I purchased that chassis from him, and we ended up building an entire car. The build really evolved as we went—it became a really custom, one-off project. They have this desire to do something that's above and beyond what everyone else is doing, and they have the ability to actually deliver on that."

Through the shop's racing efforts and word of mouth, Neil & Parks has built a reputation in the Nostalgia community that keeps customers coming back. "We try to do what the customer needs, and that's not always what they might want when they come in the door," Scott said. "We're not going to do something for them that we know isn't going to work. We'll take on experimental projects from time to time, but we make it clear up front that there are no guarantees with stuff like that. Ultimately, we just try to treat our customers right. We don't mess with them on price, we do the work right, and we try to get the work done in a reasonable amount of time." **PRI**

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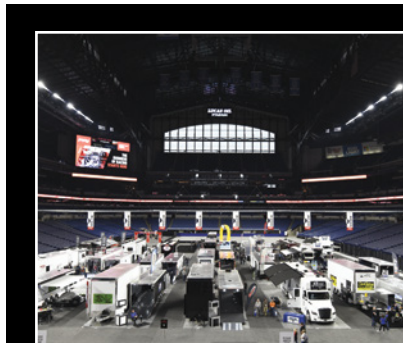
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CUSTOM COMBINATIONS

OIL SYSTEM COMPONENT MANUFACTURERS WORK PAINSTAKINGLY TO PROVIDE TAILOR-MADE SOLUTIONS TO COMPLEX LUBRICATION SCENARIOS.

By Jim Donnelly

Amid all the bromides and sloganeering directed at the world of racing engines, this much is an unshakable truth: Inadequate oiling, for any reason, is going to invariably result in a dead engine and a lost race. Keeping the engine sated with slippery stuff is paramount. Doing so in an environment where physics, or simply rules, restrict the available room to package an engine's oiling system is a crucial challenge.

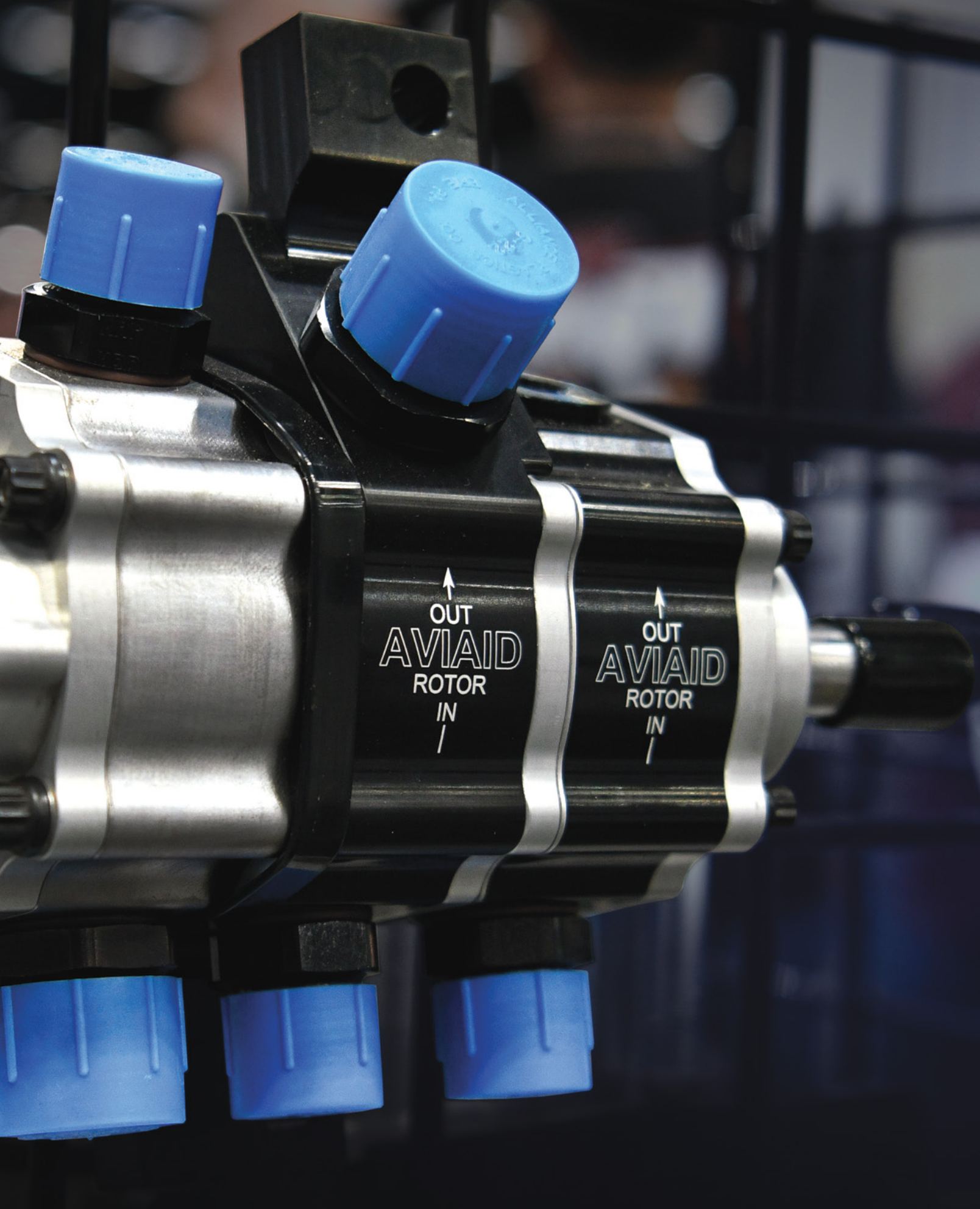
Fortunately, the racing industry is well-populated with manufacturers who have been thinking about customized lubrication applications for a long time. The variety of components they offer to provide proper oiling in a tight space, or a constricted regulatory environment, is impressively broad and effective.

"We used to be more involved in custom

oil pans, but now, it seems, we're mostly advising other people on how to build their own because everybody seems to have their own CNC machines," said John Schwarz of AVIAID, Chatsworth, California. "Typically, engine builders, chassis builders, people who are trying to package a dry-sump system into a vehicle are already making a lot of their own parts. What we do are basic lubrication system components."

AVIAID's entrée into customization is actually a very basic part, called a builder core, which is an unfinished oil pan stamping that's 4.5 inches deep at the bottom, just like a small block Chevrolet V8's wet sump.

"WHEN I LOOK AT MY CATALOG, I HAVE 40 DIFFERENT WAYS TO MOUNT AN OIL PUMP."



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"If you're building a dry-sump pan, with typically three or four different pickups, right or left side, the pan core becomes the framework that we build our features into to accomplish our goal," Schwarz said. "Nobody runs wet sump unless they're required to. Basically, someone will tell us where they have suspension components, crossmembers, transaxes; and the core is minimum displacement, as shallow and narrow as can be, and we add from there."

AVIAID currently offers a series of wet-sump oil pumps utilizing both belt and camshaft drive, with a variety of diameters and flow capabilities. AVIAID's wet-sump pans are designed from the start for road racing applications, with the appropriate pickup locations for race cars turning left and right. The pans are fabricated from steel and cadmium plated. One application covers American Motors engines, in addition to the more common Chevrolet and Ford parts. ARP fasteners and Fel-Pro gaskets are standard with AVIAID installations.

"THE OILING SYSTEM ON A 305 IS JUST AS DEMANDING AS A 360 OR A 410 OUTLAW MOTOR."

Schwarz said that most US customers are using Chevrolet or Ford engines, which eliminates much of the dimensional guesswork. AVIAID also does extensive work with import-sourced engines and will have customers request an oiling solution for a turbocharged four-cylinder engine that has to fit tightly into a specific chassis space. "We also do a 5,500- to 6,000-horsepower John Deere engine with 5 pounds of turbo boost for tractor pulling. When I look at my catalog, I have 40 different ways to mount an oil pump."

WORKING WITH A LEGEND

Melling Engine Parts of Jackson, Michigan, doesn't offer custom-designed oiling systems

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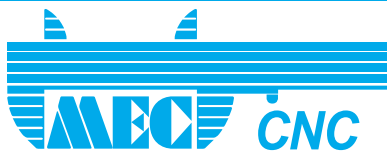
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MEC CNC represents the Robins line of machines. Robins has a range of Seat & Guide Machines able to handle from the smallest to extra large cylinder heads. Robins offers 2 models of head and block surfacing machines and a valve grinding machine. Robins are introducing a brand new valve guide honing machine at PRI 2022.



MEC CNC represents the Trego line of equipment. Trego is world known for valve spring assembly benches and MEC CNC has introduced the brand new extra large bench for 24 valve diesel heads such as CAT and Cummins.

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AVIAID builds wet- and dry-sump oil pans, oil pumps, and other oiling solutions for applications that run the gamut from turbocharged four-cylinder engines to popular Ford and Chevy V8s (including the LS engines) to “a 5,500- to 6,000-horsepower John Deere engine with 5 pounds of turbo boost for tractor pulling,” said our source.



per se, but Mike Osterhaus said that research with longtime customers can result in the kind of innovation that leads to custom packaging, or performance parameters.

“One such example is our 10294 low-volume performance LS oil pump. The idea for that oil pump originated from a conversation at the SEMA Show a number of years ago with Richard Maskin, the founder of Dart Machinery,” Osterhaus recalled. “At that time, Richard was developing Dart’s LS Next engine and needed a solution to an oiling issue he encountered. The LS Next design incorporated priority main oiling that supplied oil to the main bearings first before the camshaft, lifters, and valvetrain. In early testing, Richard found that the flow rate of the original Gen III oil pump created high oil pressure across the engine’s operating range. He had installed a variety of different pressure relief springs, but the oil pressure was still too high, and he needed a solution. The answer was in reducing the amount of oil flow provided by the pump.”

The LS oil pump is designed for use with performance aftermarket Chevrolet LS engine blocks with priority main oiling, and without variable valve timing or Displacement on Demand features. With 15% lower volume than stock, the high-pressure LS pump has a cast-aluminum housing, an anodized hard-coated body with phosphate-coated cover, and it utilizes standard steel rotors. A high-pressure spring is optional. The pump uses a 7/8th-inch bolt-on screen.

Melling built up a series of prototype oiling assemblies with stepped drops in oil flow for dyno testing. “We found that reducing the flow by 15% was the best solution,” Osterhaus explained. “With validation testing completed, we then moved to the production phase and added the pump to our performance oil pump product line. The 10294 low-volume performance oil pump comes with all the features that make the Melling Performance wet-sump oil pumps best in class. Features include a hard-coat-anodized housing,

Melling’s 10294 low-volume performance LS oil pump was the result of a collaboration with Dart Machinery, which was experiencing high oil pressure when developing its LS Next engine design. “The answer was in reducing the amount of oil flow provided by the pump,” said a source.



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coated cast iron cover plate, exclusive rotor design, and optional springs to increase the pump's original bypass pressure setting by 10 psi and 25 psi."

DEMANDING ENVIRONMENT

Quantifying oil flow in customized applications was the same sort of research undertaken at Schumann's Sales & Service of Blue Grass, Iowa, which currently has 13 patents applied for, pending, or issued for designing oiling solutions. Company founder Verne Schumann—who calls himself a tribologist, after the physical study of interactive surfaces in motion—said that much of his research and product development is aimed at race classes that require wet-sump systems due to rules.

"The most demanding oil-pump application in the country is 305 sprint cars because of their rpm potential, plus the fact that they're mostly fuel injected and pushing out almost 2 horsepower per cubic inch these days," Schumann said. "With promoter's restrictions, such as flat tappet camshafts or compression ratios, they're doing it the hard way. It is the most demanding because you have to use 305 bore and stroke and the 42-pound crankshaft. The oiling system on a 305 is just as demanding as a 360 or a 410 Outlaw motor."

The research led Schumann to develop a \$400 oil pump for wet-sump applications, and to develop a new way of measuring oil flow, in feet per second. Schumann's specialized solutions include the patented Paddle Wheel configurations for common gear-to-gear oil pumps, which result in higher flow rates at both GPM and feet per second at the same engine rpm, requiring less horsepower to move the oil. The firm also produced the ER-VAC wet-sump pump system that allows for maximum energy recovery while being unaffected by G-loadings, a key consideration for rock crawlers and Monster Truck teams. Schumann's has also developed its 140 Ball Valve, which reacts in a fraction of the time needed by conventional OEM-style cup valve systems, allowing surplus oil to vacate the sump at lower oil temperature and with no impact on ignition timing.

Conventional gear-to-gear oil pumps essentially squeeze the oil to move it via the

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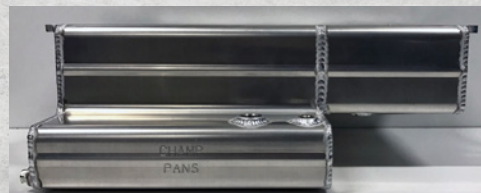
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For more info: champpans.com/products/c/oil-pans

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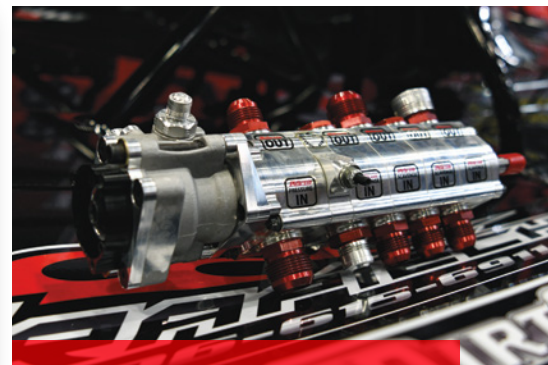
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The custom oil pumps from Peterson Fluid Systems are modular in design and can accommodate anywhere from one to eight stages. Most of Peterson's custom pumps use off-the-shelf components, which minimizes custom machine work.

JONES RACING PRODUCTS



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- Hard-coated billet aluminum.
- Tooth counts from 28 through 56.
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- Made in the USA.

For more info: jonesracingproducts.com



curvature of the teeth in the gears as they rotate against each other. The Paddle Wheel gearing incorporates cup cavities in the pump's idler gear that aim high-velocity oil at the outlet of the pump. While the meshing of the gears is the primary means of moving the oil, the Paddle Wheel adds a secondary level of oil transfer within the same pump housing.

Schumann's offers performance wet-sump oiling systems for truck, circle track, and drag applications, the latter including atypical engine applications such as the big-block Oldsmobile. The same "dimple tech" gear design incorporated in the Paddle Wheel is also utilized by a high-performance wet-sump pump created for the 2.5-liter Subaru engine.

"What makes the Paddle Wheel work is when oil oozes up through the idler gears, the gears are parabolic shape, but the cavity cup is exactly the opposite, spherical," Schumann said "Each tooth on the idler gear has a cavity cup machined into it. So we came out with feet per second measurement."

MELLING ENGINE PARTS



10342HV HIGH VOLUME, HIGH PRESSURE OIL PUMP

- Improved design on the third generation Chrysler Hemi oil pump to increase its volumetric output by 20%.
- Design changes combine to improve its performance and durability.
- Comes assembled with a high-pressure relief valve spring, which increases the bypass pressure by 10 psi.
- Comes with an optional standard pressure spring and a +15 psi higher spring.
- Intended for use in performance 5.7L and 6.1L Hemi engines with increased oiling demands.

For more info: melling.com



CUSTOMIZING OFF-THE-SHELF COMPONENTS

Peterson Fluid Systems of Longmont, Colorado, offers several options for custom components, ranging from single, one-off custom pieces to engineered parts ordered in limited quantity. The firm expects to

resume fabrication of custom sump tanks shortly. Typical custom parts are oil pumps, as Peterson works with engine builders on specific requirements regarding flow rate and the type of scavenging needed for a particular application.

Peterson pumps can range from one to eight stages, with multiple sizes of rotors and different shaft designs and lengths for the pump drive. Since the pump is modular, most custom pumps utilize off-the-shelf components. Due to the unique design of the R4 I pump, it allows for a solid foundation from which a plug-and-play type construction can be built. The combination of off-the-shelf components allows a custom application with minimal additional custom machine work. In most cases, the custom components are centered around the shaft assembly, such as a male hex key for the installation of a front-mounted ProCharger supercharger.

DRY-SUMP OFFERINGS

When it comes to dry-sump oiling for performance engines, two of the industry's pioneers are Gary and Sandy Armstrong, who founded Armstrong Race Engineering in 1974, and first began fabricating dry-sump oiling systems after getting their start building race engines. Gary Armstrong started making dry-sump pans out of cast alloy 356A T6 aircraft aluminum, the same material used for oiling systems by numerous Formula 1, Indy car, and Le Mans racing teams. Within 10 years, ARE Dry Sump Systems was building products for competition Corvettes and Formula 5000, as well as NASCAR teams, and was no longer building racing engines.

The Armstrongs are now in the process of selling ARE Dry Sump Systems to Krage and Rachel Faulkner of Oroville, California, and their business, Advanced Race Engineering Inc. The company still lives up to the Armstrong standard of comprehensive dry-sump solutions, with more than 55 different dry-sump pans currently produced, mostly CNC machined. As Gary Armstrong explained, "The state-of-the-art designs led us to contracts with GM, Chevrolet Racing, TRD, Honda, and so on, which carry on to this day. Our desire to build high-tech, dyno-proven dry sumps by working directly with

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For more info: pbm-erson.com

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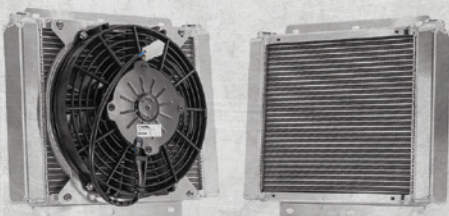
For more info: petersonfluidsys.com

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of oil coolers, which are available in different shapes and sizes in an effort to accommodate our customers who present us with various types of oil cooling challenges for aftermarket applications,” Johnson said. “These challenges are normally resolved by offering packaging solutions where we help the customer place the right-sized oil cooler in the best location available in his vehicle to achieve maximum cooling performance.”

INSURANCE PROTECTION

Some oiling solutions can be made applicable to both dry- and wet-sump lubrication systems. At Canton Racing Products in North Branford, Connecticut, engineers have developed an intermediate component that ensures the crucial bearings are properly fed under all rpm and loading scenarios. “Our Accusump oil accumulators, which we’ve been producing for more than 35 years, would be the best fit for a custom application,” Iann Criscuolo explained. “Accusump stores pressurized oil from a canister with oil on one end and air pressure on the other side. When oil falls below [the oil level] in the Accusump, it pushes the oil to supply the engine bearings under high-performance applications in any kind of racing you can think of, for both wet-sump and dry-sump systems.

SCHUMANN'S SALES AND SERVICE



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For more info: schumannssalesandservice.com



the factories and pro engine builders has always kept us up front.”

The Armstrongs aren't ready to retire, not by any means. In 2011, they formed Spintrix Technologies, which created and continues to market an inline air-oil separator for dry-sump systems. “As most dry sumps scavenge out two to three times more air than oil out of engines, this invention separates as much as 80% of the air on the return to the pan,” Gary explained. “Now, there are 10 patents on Spintrix products, including our dry-sump tanks, atmospheric vent cans, air-oil separators, filter adapters, screens, and more.”

Gary Armstrong received a patent in 1983 for a mechanical separator for air and oil

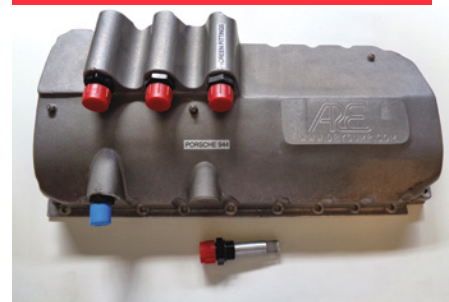
incorporated within the pump of a dry-sump oiling system, using the physical concept of centripetal force. The Spintrix, as designed, has no moving parts and is mounted separately from the pump. The separation force is generated by the internal channels of the Spintrix as oil passes through the assembly. The percentage of air varies with pump rpm, oil temperature, and flow volume.

PACKAGING REQUIREMENTS

At FLUIDYNE High Performance in Mooresville, North Carolina, Gary Johnson said the firm's oiling answers are largely determined by the space and packaging requirements dictated by customers.

“FLUIDYNE makes a wide variety

ARE's work with dry sump oiling systems dates back to the mid-1970s, when it started making pans out of 356 T6 aircraft-grade aluminum alloy. “The state-of-the-art designs led us to contracts with GM, Chevrolet Racing, TRD, Honda, and so on, which carry on to this day,” said our source.



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Canton Racing Products' Accusump oil accumulator stores oil in a pressurized canister to lubricate engine bearings under high-performance applications. The Accusump can be plumbed into wet- or dry-sump oiling systems.

Canton markets the Accusump system as one of the most original designs of automotive oil accumulators on the market today. Each Accusump accumulator is precision fabricated from heavy-wall, roller-burnished aluminum tubing, with a Teflon hard-coated interior. Each accumulator uses a billet aluminum internal piston with screw-in end caps and is equipped with an internal pressure release valve. For turbocharged applications, Canton also produces the Accusump Turbo-Oiler, which supplies a pressurized flow of oil to hot turbocharger bearings during spool-down, making bearing failure less likely. The turbo after-oiler prevents heat-related coke buildup, which can limit oil flow to the turbocharger bearings.

Variations in ambient air pressure and oil viscosity determine how quickly the oil dumps from the Accusump, with Canton engineers recommending 5 to 7 psi. Canton is primarily focused through its product lineup at budget-minded racers, so the majority of its catalog deals with wet-sump systems, which have broad applications including oval track, road racing, autocross, off-road competition, and even aircraft.

"There are only a few things that can really be customized, one by purchasing the size of components they really need for their type of engine, or that need pre-oiling to stop dry-start

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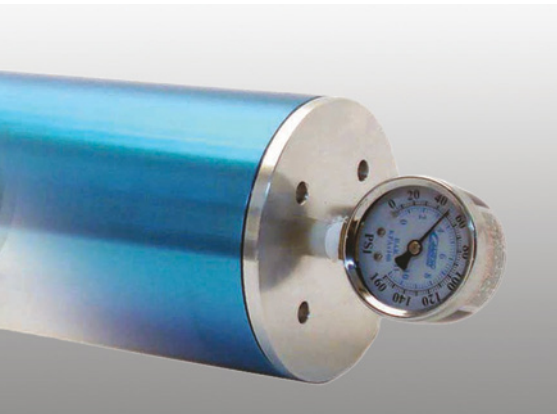
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scuffing inside the engine," Criscuolo added. "The Accusump is more of an additive to someone that has an oil system already. It can improve the longevity of the race engine, as well as being a little insurance that the oiling system isn't going to be an issue." **PRI**

SOURCES

ARE Dry Sump Systems
drysump.com

AVIAID
aviaid.com

Canton Racing Products
cantonracingproducts.com

Champ Pans
champfans.com

Clear View Filtration
clearviewfiltration.com

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DIRECT CONNECTION

Properly installing rods will help ensure optimum race-engine longevity and performance, and our expert sources are here to provide best practices on securing these critical components.

By Mike Magda

Connecting rod manufacturers are vigilant in providing detailed installation instructions; yet there's no surprise in the number of phone calls from customers complaining that the rod is ground zero for some type of engine failure.

"There are engine builders. There are engine assemblers. And there are novices or hobbyists," lamented Roger Friedman of Dyer's Top Rods, Forrest, Illinois, stressing that the rod often is only as good as the customer. When they get it wrong, "the rod always gets the blame."

Perhaps a wide-ranging platform of media options is partly responsible. In addition to the manufacturer instructions, there are dozens of how-to stories featured in enthusiast magazines, tech books, cable TV shows, and Internet forums. Maybe all

the attention has made this step in the engine assembly look too easy.

And maybe the best practices don't always get the attention they deserve. Take, for example, the practice of measuring side clearance between two connecting rods paired on the same crankshaft journal. Sometimes this measurement is called the "cheek" clearance.

This small gap is a way to control the amount of oil lost from the bearings and sprayed on the cylinder wall, wrist pins, and piston. The gap will vary between .010- and .020-inch, depending on manufacturer recommendations and type of rod material. Steel rods don't need as much clearance as aluminum.

The most popular method of checking the side clearance is



with a feeler gauge. Start with a thin blade and work up until the blade just slips between the two rods. Most photos detailing this step show a single feeler gauge being used, and for the most part that approach is adequate for a general-purpose engine build. However, savvy racers will use two feeler gauges to ensure the exact side clearance is measured.

“When using a single feeler gauge, the actual bearing clearance can cause the rod and bearing to cock,” said Tom Lieb of Scat Crankshafts, Redondo Beach, California. “You don’t really get the correct end play.”

Lieb recommended using two feeler gauges of the same thickness to measure the gap 180 degrees from each other. “Say you have .002- to .003-inch bearing clearance. Basically, you will bottom one corner of each bearing against the crankshaft while raising the other side,” explained Lieb. “However, in reality, the bearings move parallel to the

crank journal surface. They don’t slide back and forth in a cocked position. If you’re looking for .018-inch clearance, take two .018-inch feeler gauges and measure the gap 180 degrees between the two rods on the crank journal.”

INDUSTRY THOUGHTS

With that in mind, we sampled the industry for the best advice for installing connecting rods. What are the do’s and don’ts of this critical procedure? The connecting rod may appear to be a simple design, but there is considerable technology in choice of materials, methods of construction, and overall structure and configuration. Also, the rod has to work in harmony with the wrist pin, bearings, pistons, and crankshaft, which all have design elements that complement the connecting rod. Improper installation will simply waste that technology. Right away we were faced with a reality check on this quest for wisdom.

“We deal only in very high-end applications,” admitted Stefan Verdi of Auto Verdi, Söderbärke, Sweden. “So we deal with very experienced engine builders and don’t have problems with installation.”

Okay, let’s start with the basics. Perhaps the most obvious tip is cleanliness.

“Always check the threads and clean the rods before assembly,” said Nick DiBlasi of



Connecting rods may appear to be of a simple design, but a considerable amount of advanced technology goes into their choice of materials, methods of construction, and overall structure and configuration.

Race Winning Brands, Mentor, Ohio, which encompasses rod manufacturers BoostLine, K1 Technologies, Manley, and MGP.

“Thoroughly clean components before installation and be sure they are rid of any foreign dirt and oils,” added Matt Polena of K1.

Properly locating the bearings on the rod body and cap is a step often missed in the assembly. “Many high-performance bearings have an ‘upper’ and a ‘lower’ designation, usually found on the back side of the bearing,” said Alan Davis of Eagle Specialty Products, Southaven, Mississippi. “It is important that the upper bearing is installed in the beam portion of the rod and the lower bearing is installed in the cap portion. Installing these incorrectly can cause the appearance of reduced side clearance or possibly causing the bearing to rub on the radius of the crankshaft.”

“People will put them in backwards,” added Friedman, “and then the bearing will hit on the radius of the crank. That’s when they have a bearing failure and blame the rod.”

The position is important because bearings have one edge that is chamfered, and it’s designed to ride on the radius side of the crankshaft. The radius is machined into the crankshaft rod journals to help reduce stress concentrations and improve lubrication at those locations. The other side of the rod is flat and designed to face the matching side of the adjacent rod mounted on the same crank journal.



Tightening the connecting rod’s cap screws is a hot topic among manufacturers. Each has a preferred technique, requiring purpose-built measuring devices and proper lubricant.

ROD SQUAD

Following are several of the latest connecting rod models from 12 leading product manufacturers.

Auto Verdi

This connecting rod from Auto Verdi was specially designed for the V8 flat-plane crankshaft engines in the Koenigsegg supercars built in Europe. Engineers relied on extensive computer simulation models before the final lightweight design was sent to Auto Verdi, where the company machines forgings pressed from a proprietary steel alloy.



BoostLine

These rods for the GM 6.6-liter Duramax and Cummins 5.9- and 6.7-liter (shown) diesel engines are built to withstand 2,000-plus lbs.-ft. of torque. Both have the patented three-pocket design that reduces weight while maintaining strength. They are forged from 4340 steel and come with 12-mm ARP2000 fine-thread fasteners.



Callies Performance Products

The new Compstar Xtreme line features design elements of both the H- and I-beam connecting rods. Overall, it's an H-beam constructed of 4340 steel alloy, but there's an I-beam style trough cut out of the surface to reduce weight. Engineers also beefed up the web thickness. The big block Chevy, LS, and Duramax diesel are the first applications for this new line.



CP-Carrillo

Factory approved rods for the Ford 5.3-liter Super Cobra Jet V8 that runs in the NHRA Factory Stock Showdown are available from CP-Carrillo. The rod was designed specifically to meet the demands of drag racers running the 2019 Mustang, including supporting 1,500 horsepower and spinning up to 10,000 rpm. The rod can also be used in 4.6/5.0 stroker applications.



In addition to a wide range of off-the-shelf connecting rods, Callies can produce prototype rods to suit fully custom engine applications.

Some connecting rods are designed with an offset. That is, the big end is slightly offset from the rod beam's centerline. This is to accommodate engine designs where the centerline of the cylinder bore is slightly offset from the rod-bearing radial centerline. Experienced eyes will notice the offset and install the rods in the correct order. However, depending on the offset and the engine, it's not always a game-changer.

"The LS engine has on-center rods in the motor. When the LS first came out, nobody was making LS-specific rods, you know, with an on-center beam," recalled Brook Piper of Callies Performance Products, Fostoria, Ohio. "So, everybody was using small block Chevy rods and never had an issue. Guys to this day still use small block Chevy rods that are offset in a LS application.

"I don't know that it's a critical issue," he continued. "I suppose it would probably mean something if you're going 300,000 miles. But race-car guys are tearing engines down and putting in new rings and pistons all the time."

MIXING IT UP

Connecting rods are constructed with the body and caps married to each other. Never mix the caps and beams. Some manufacturers will number match the two pieces in the manufacturing process. If a new set of rods is not already number matched, then mark them immediately

upon unpacking.

“But avoid using metal stamps to number rods,” warned Polena. “The rod bore conformity and roundness can be affected by the use of metal stamps. We recommend using layout dye on the cap and rod and scribing or etching the numbers.”

“Also, never flip the caps around when assembling,” added Davis. “This can result in a bunch of problems. They are not symmetrical. Pay close attention to the cap orientation when assembling.”

Consistent rod weight is crucial to the balancing operation. However, some engine builders get a little too finicky and may ruin the rod trying to achieve equal weights.

“There are a lot of perfectionists who like to think that every rod should weigh perfectly on both ends. We tell people if they’re within one or two or three grams, please don’t grind on them,” said Friedman. “When you grind on them and look at the metal through a microscope, you see



Connecting rods, like these from CP-Carrillo, are constructed with the bodies and caps married to each other. For the rods to function properly, it’s crucial that the caps and beams aren’t mixed during engine assembly.

fractures in the metal that will propagate a crack and cause a failure.”

If rods need to be lightened or the big ends need to be narrowed to provide the correct cheek clearance, then call on a qualified machine shop to remove

the metal properly. And rods should be matched in weight.

“Never order a single rod without providing the big-end and small-end weights of one of the rods in your set,” advised Davis. “Eagle keeps many single rods in stock, and we can usually match the weight you need very closely. ‘I’ll make it work,’ sounds great until you get a rod that’s 15 grams lighter than your other seven, and then you have to remove 15 grams from those to make a balanced set. If you do not have a record of the weights when the engine was balanced, have a machine shop weigh one for you.”

HIGH TENSION

The hottest topic, by far, when discussing connecting rod installation is tightening the cap screws. For some, the practice developed into a precision art that requires purpose-built measuring devices. The days of “torque to 50 ft.-lbs. and then give it an

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extra tug” are over. The first bit of advice that stands out, is “don’t assume anything.”

“Always double check your torque spec on the rod bolts,” said Will Vance of Lunati, Olive Branch, Mississippi. “Don’t assume

it is the same as the original factory part. This is one of the bigger issues, believe it or not, of end users. Most all our rods carry the ARP2000 7/16-inch bolt that holds more torque than an OEM rod bolt.

We have call after call where the customer said the bolts were torqued to 45 ft.-lbs. and they say, ‘That’s good, right?’ Most of our products carry a torque spec of 73 ft.-lbs. with lubricant.”

Manufacturers cannot stress hard enough that the proper lubricant is critical to achieving honest and consistent torque figures.

“Each fastener is designed to stretch a specific amount using a specific lube,” said DiBlasi. “Changing that lube dramatically changes the tension and changes the amount of torque required to achieve the stretch.”

“Make sure everything is clean, including the threads in the rods and the bolts,” advised Tom Molnar of Molnar Technologies, Kentwood, Michigan. “Also, make sure the lube recommended by the rod manufacturer is used, and apply the lube every time the bolts are installed, even when checking bearing clearance.”

Ask a dozen top engine builders how they install piston rings, and you’re likely to find 10–12 methods that differ slightly from one to another. The result is the same, but experienced engine builders have their tricks, techniques, and even superstitions that they follow every time. What follows is a sampling of advice for tightening rod bolts from our group of experts.

“We recommend using bolt stretch as the best method,” said Richard Batchelor of CP-Carrillo, Irvine, California. “We’ve added torque angle as the second-best method, since some applications like angled rods have blind holes, and measuring stretch is just not possible. We always tell customers that they should not use torque alone, as it is only measuring the amount of force required to overcome the friction between surfaces.”

“Bolts are nothing more than very stiff springs, and they must be stretched the proper amount to provide the correct clamping load,” explained Molnar. “Since it’s easier to use a torque wrench to tighten bolts, some people will tighten the bolts and note the amount of torque it takes to get to the right stretch then use this value to tighten the remaining bolts. The problem with torque is that it

Crower

This is Crower’s go-to titanium connecting rod for small block Chevy engines used in sprint cars, dirt late models and even Trophy Trucks. It has a 6.000-inch center-to-center distance with a 2.125-inch big-end bearing. Constructed from aerospace-quality titanium, the rod features Crower’s Maxi-light radial beam design, blended radiuses, and no straight lines in the beam.



Dyer’s Top Rods

First designed as a prototype for a sprint-car customer three years ago and later released as the NTL series from Dyer’s, this rod features a heavily beefed-up Honda-sized big end and a tapered H-beam. It’s constructed from 300M steel and available in 5.700- or 5.850-inch lengths. That first customer is still running the same rods four years later.



Eagle Specialty Products

Here’s a sneak peek at Eagle’s fourth-generation H-beam rods that incorporate several measures to improve strength and rigidity on the big end. Thickness of the webbing in the beam area was also increased to handle higher compressive and tensile loading. This rod is 100% CNC machined on every surface to achieve tight tolerances. Part numbers and applications will be revealed as the product rolls out later this year.



K1 Technologies

K1 is expanding its lineup of small block Chevy H-beam rods with this 5.850-inch model. It’s manufactured from 4340 forgings and shot-peened to reduce stress risers. The rods come with ARP2000 fasteners. The 5.850-inch center-to-center distance gives the builder added flexibility when matching crankshaft, pistons, and deck height.



measures friction, not clamping load.

“Since the mating surfaces (threads in the rod, threads on the bolt, spot face on the rod, and flange of the bolt) can change with each tightening, it makes the correct torque a moving target,” continued Molnar. “Measuring bolt stretch is more difficult than using torque, but it is always a more accurate way to ensure the bolts are tightened correctly and helps keep the big-end bores round and to size.”

“It’s a very good idea to record the untorqued, free length of each bolt before use. On subsequent engine tear-downs, compare the untorqued free length of the bolts with their original value,” suggested Davis. “If you see any change, it is time to replace the bolts. This is the very best way to evaluate the condition of the rod bolts. Just going by ‘number of runs’ or something obscure like that is not accurate at all. Different engines have wildly different stress levels. It is impossible to gauge the life of



If connecting rods need to be lightened, or material removed to provide the correct cheek clearance, our sources recommend taking them to a qualified machine shop rather than performing DIY grinding. Improper grinding creates microscopic fractures that can lead to a rod failing.

rod bolts with any accuracy based on how many times they have been run.”

Steel rods have taken up all the discussion so far, but there are racers running aluminum and titanium rods to lower the rotating weight. Following are a

couple of tips for these materials.

“It seems to be much more prevalent with aluminum rods to see installers intentionally over-torque the bolts to achieve greater clamping force, say 130 ft.-lbs. versus the recommended 105 ft.-lbs. The concern here is stress on the threads and crank bore distortion,” cautioned Michael Tokarchik of Manley Performance Products, Lakewood, New Jersey, which recently absorbed the manufacturing duties of MGP Connecting Rods under the Race Winning Brands corporate umbrella.

“When installing titanium rods, the setup is almost the same as steel as far as clearances and the like,” said Peter Harris of Crower Cams, San Diego, California. “The biggest problem we see with installation is sneaking up on the bolt torque. They’ll torque them to 10, then 20, then 30 and so on. Titanium tends to grab the bolt doing it this way, and then you’ll run into bolt problems down the road. A titanium rod wants a well-

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lubricated bolt and one sweeping motion to the recommended torque.”

Not sneaking up on the final torque number is also good advice for users of steel rods.

“I have explained to customers that going

in small increments, such as 2 to 5 ft.-lbs. at a time, is not a good idea. It may take that just to overcome the friction, and you may not have actually moved the bolt,” warned Batchelor. “We had a customer who was only going up 2 ft.-lbs. at a time.

He reached our max torque and stopped, not realizing that the bolts were under-stretched. Because of that, this resulted in a premature failure of the bolt.”

And the customer probably at some point blamed the connecting rod for the failure.

While the connecting rod is simple in design and function, care must be exercised when installing them. Actual connecting rod failures are rare in motorsports. If a rod bends or breaks, it's almost always due to improper installation or another contributing factor, such as poor lubrication or severe detonation. **PRI**

Lunati

The X-Beam connecting rod line from Lunati is a hybrid of the I-beam and H-beam design theories. They're forged from 4340 steel and have been stress-relieved and shot-peened; plus, all X-Beam rods are weight matched to ± 1 gram. These rods are rated for use in forced-induction engines up to 1,700 horsepower and 9,000 rpm.

Manley Performance Products

Available for more than 30 applications, Manley's Turbo Tuff connecting rods are offered in a unique Tri-Beam design. They're forged from 4340 vacuum-degassed steel alloy and shot-peened after machining. The rods come with twin oil pin holes on the little end and 3/8-inch fasteners. Rated for four-cylinder engines up to 1,000 horsepower, and eight-cylinder up to 1,500 horsepower.

Molnar Technologies

Two rods are available for the Ford 7.3-liter Godzilla V8 in the PWR ADR and PWR ADR Plus models. Both accept the Ford Modular bearing, so the bearings do not have to be narrowed when using aftermarket cranks with large fillet radii on the journals. They are also sized for a .990-inch diameter wrist pin and come with rod bolts made from Molnar's exclusive ARP2000 material.

Scat Crankshafts

Used in a number of factory crate motors, the Pro Series I-beam is Scat's most popular connecting rod due to the strength versus cost benefits. Forged from 4340 steel, it features hollow dowels, large 7/16-inch 8740 chromoly steel fasteners, and the rods are polished and shot-peened to eliminate stress risers.



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MEMBER CHECK-IN

SRO MOTORSPORTS GROUP AMERICA

To secure racing's future, SRO Motorsports Group America President and CEO Greg Gill believes the industry must "start talking to a broader group of people than just ourselves."

By Jim Donnelly

Some racing series make do with a mere handful of manufacturer participants, engine suppliers, or title sponsors. That's why it's dizzying to contemplate the welter of corporate partners that SRO Motorsports Group has been managing for the past three decades. Founded in 1995 by Stephane Ratel, SRO Motorsports Group is recognized as the global leader in presenting GT events on road courses, contested by a multitude of household-name automotive brands. In 2022, GT races will be staged under SRO tutelage on five continents, led by the umbrella group's signature event, the TotalEnergies 24 Hours of Spa in Belgium.

In addition to a heavy overseas presence, buttressed by operations at the SRO Race

Centre at Circuit Paul Ricard in France, SRO has a very formidable footprint in North America, led from its headquarters in Austin, Texas. SRO America's new GT America series, backed by Amazon World Services, debuted last year with single-driver sprints in a pair of timed 40-minute races at each event weekend, with GT3, GT2, and GT4 classes eligible. No fewer than 14 makes of cars compete. Nearly all the same makes also take part in SRO America's Pirelli GT4 America championship, which adds Saleen and, most recently, the new Lotus Emira GT4 as legal cars, running in Pro-Am, Silver, and Am categories during race weekends.

That's a ton of competitors, manufacturers, and sponsors to keep happy, yet SRO Motorsports has been doing it for decades with success. "It's pretty simple," SRO Motorsports Group America President and CEO Greg Gill explained. "Pirelli is the spec tire for all of our racing series, and in terms of balancing the interests of all of the OEMs, it really comes down to respecting what their platforms are. And, by the same token, keeping it fair. It's something of a curse word to some people, but it's about balance of performance. In our case, it's not only balancing the vehicles through annual testing, but also looking at the facilities where we race and finding the commonalities of those facilities around the world. We have an

alphanumeric letter-based system of track rankings. We can use the parameters from those tracks with the vehicle manufacturers to evaluate power-to-weight ratio and the performance dynamics of the vehicle.

"It's a well-measured system," he added. "If you measure our GT classes, the top five to top 10 are within a tenth of a second in terms of lap times. That's what it comes down to. It comes down to the drivers."

Some of SRO America's precise evaluation protocols are proprietary, although Gill described the basics. It's common for SRO America to monitor some 20 channels of vehicle data, in conjunction with the manufacturers, while coming up with its balance-of-performance parameters. "There are literally tens of thousands of data points that you can analyze," he said. "We're working with onboard computers and system diagnostics to learn what is the best outcome we can get for a particular track or a particular manufacturer. This vehicle may need more air coming into the engine, another vehicle may need less air in terms of downforce, and another vehicle may need a little more weight, or a little less. It's a balancing act, quite literally."

SRO America has a broad presence in road racing, mirroring its parent company's international footprint. In the United States, the group partners with the United States Auto Club (USAC). According to Gill, competitors often move to SRO America after training with another longtime ally, the Skip Barber Racing School, or transfer out of single-make racing series such as the Lamborghini Super Trofeo, Porsche Carrera Cup, or Ferrari Challenge. Manufacturers in the series run from A (Acura) to T (Toyota), with exotics such as the Bentley Continental GT3 and X-bow track cars from KTM mixed in. The GT4 America series adds Ginetta, McLaren, and Saleen as producers.

"We are customer racing, and we focus on that, and we're in some ways a 30-year overnight sensation," Gill said. "We are not pursuing a factory-funded program, which can go in and out of vogue over time. It can change very quickly. We take a view that what's in the best interest of our customer is to have a stable, predictable area. We saw that in GT4 at Sonoma, where General Motors announced it will now have a fully



SRO Motorsports Group America joined PRI because "it's a connection with the core of motorsport in North America," said President and CEO Greg Gill, at left.

focused customer-racing program.”

SRO Motorsports’ formula for continued success is simple: Know your customer and make the customer your focus. Look at the customer’s goals: Is he or she a beginner, interested in moving up GT-wise, or does the customer have a specific goal of racing 24 hours at Daytona or Le Mans? “We try to learn that goal and focus on it,” Gill said, noting that SRO can already provide a 24-hour tableau for racers at Spa or 12 hours at Bathurst in Australia. “A customer may want to get involved because they think there’s a branding message and a tie-in to the paddock that’s extremely important to them. You just have to understand what the customer’s ultimate goal is.”

Making that sort of connection with the greater motorsports world propelled SRO America to join PRI. “It’s a connection with the core of motorsport in North America,” Gill explained. Looking forward, Gill sees SRO’s most immediate change as the return of

According to Greg Gill, competitors often move to SRO America after training with the Skip Barber Racing School, or they come from single-make racing series such as the Lamborghini Super Trofeo, Porsche Cup, or Ferrari Challenge. “We are customer racing, and we focus on that, and we’re in some ways a 30-year overnight sensation,” he said.



spectators to the post-pandemic paddock. “There’s a whole new group of people that we have to entertain and educate, that doesn’t see this world the way we did even a few years ago.

“The average consumer has no knowledge of saving our race cars,” he said.

“What we really want to do about developing those people’s minds about the bigger picture of transportation and mobility—which may include alt fuel—means that we’re going to have to expand our industry a lot more. We have to start talking to a broader group of people than just ourselves.” **PRI**

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PRI MOTORSPORTS RETAIL BUSINESS SURVEY: **TURNING AWAY BUSINESS**

Sometimes it's better to be selective than all-inclusive. Here, several motorsports entrepreneurs explain when and why they turn down certain jobs—and how to do so while keeping their reputations intact.

By Bruce Martin

The goal of any entrepreneur, especially in the racing industry, is to build a business so successful that it creates high demand for a specific product or craftsmanship.

The last 12 months, however, have included labor shortages and supply chain interruptions that have led some companies in racing to actually turn away business.

In the recent PRI Motorsports Retail Business Survey, when asked their best business decision the past 12 months, several respondents said they turned away work rather than accept it.

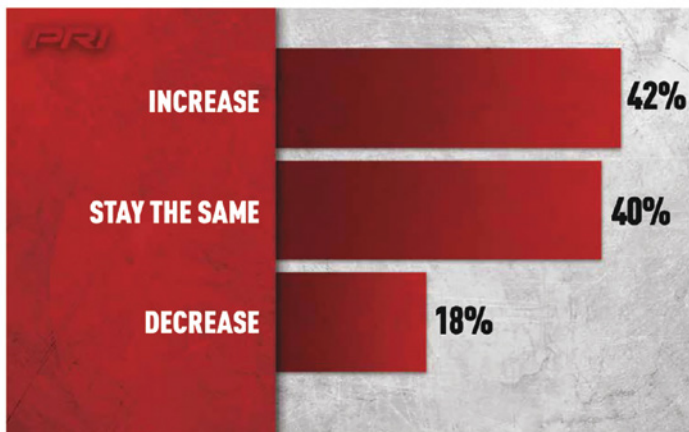
PRI Magazine contacted several racing businesses to ask the

reasons why, in a challenging economic time, they are turning away business and being more selective with the jobs they accept.

WHICH JOBS TO ACCEPT

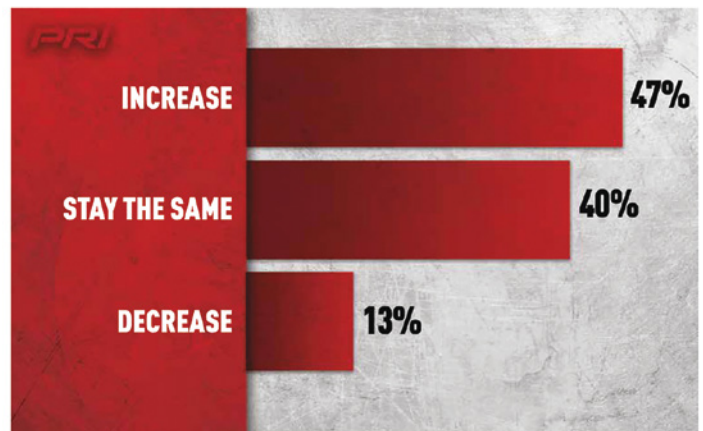
When asked about which jobs or type of work to accept, Dan Nudelman of Dan's Machine Shop in Livermore, California, cited "supply and demand." Nudelman has been running his machine shop for the past 30 years and started this line of work with his father when he was 13. Today, he specializes in the "old school muscle cars," including Mustangs, Camaros, and Corvettes. He said, "Knowing

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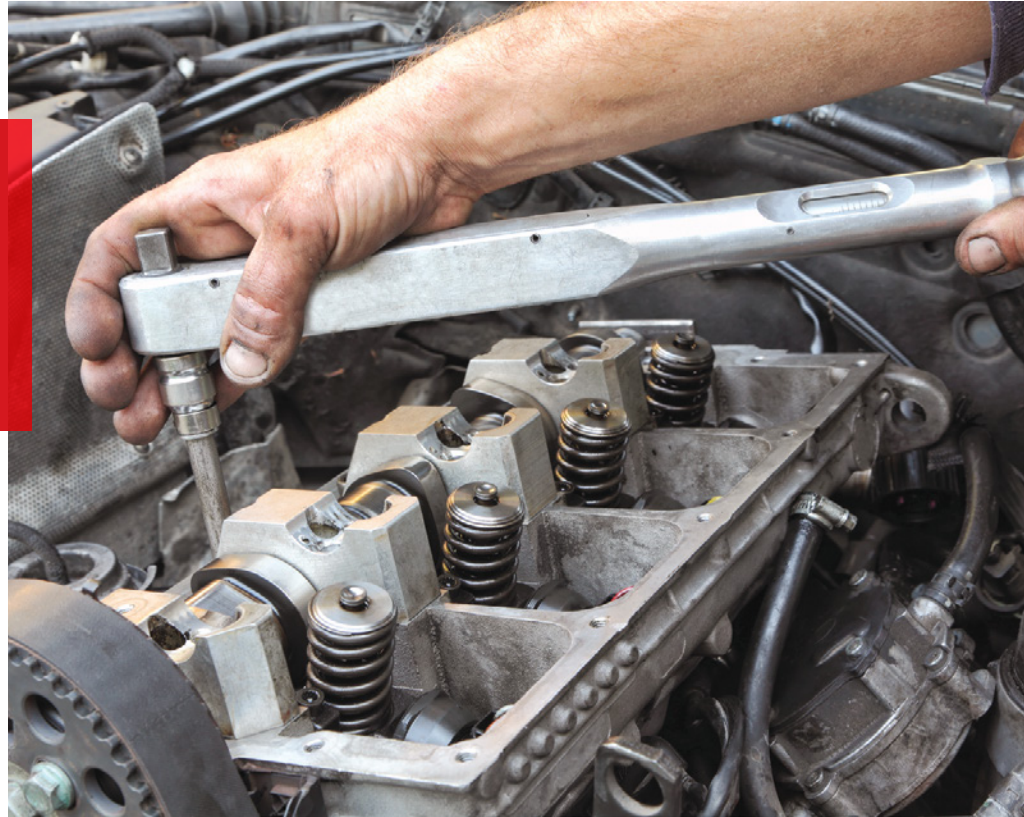
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DID YOUR COMPANY'S CUSTOMER BASE OVER THE PAST 12 MONTHS...



2022 MOTORSPORTS RETAIL BUSINESS SURVEY

“Parts issues are huge,” said Dan Nudelman of Dan’s Machine Shop in Livermore, California. Saying “no” to a customer isn’t easy, but, as he explained, “I’m sitting on 15 engines, and I have to tell people ‘no’ because I don’t have the room and can’t produce it out quick enough.”



what is not out here and what is and how it changes every day, it’s hard.

“Like everything, the parts issues are huge. I have to be forward with these guys. I don’t know how long sometimes it can take. I just had one of my customers come in a while ago who said he can’t find a part of a 454. I say, ‘Welcome to my world.’

“I’ve been in this business 54 years, and I’ve never seen it like this,” he continued. “It’s frustrating. It’s hard when you have to bounce from job to job. My jobs are small. I’m just a one-man player. I had another guy, but COVID-19 took him out, and I haven’t been able to recoup another person. I’m the teardown guy, the cleaner guy, the machine guy, the assembly guy. I’m sitting on 15 engines, and I have to tell people ‘no’ because I don’t have the room and can’t produce it out quick enough.

“I’m just being very cautious and careful. If I get these engines out, then I can move forward,” Nudelman added.

Steve Morris runs Steve Morris Engines in Muskegon, Michigan. Morris has a larger operation with seven employees and describes his business as “a busy shop with lots of work.

“We’ve developed a very good niche field of boosted engines only,” he said. “Ninety-nine percent of everything we do is boosted. If it’s not in the boosted market, then it is something we would turn away. We wouldn’t have time to do it.

“The other thing is, if it is so far out of our normal niche—say if somebody wants a 2,000 hp AMC 360—I can make it happen, but they will have to wait for it, and that’s not our normal deal. We would probably have to

turn away that thing, too.”

Morris acknowledged the supply chain challenges have affected his business. “We are currently waiting on parts and have some 20-odd jobs waiting on parts to finish.”

Roger Williams runs Williams Precision Engines in St. Paul, Indiana, and has been machining engines for 30 years. Williams has two employees, plus himself. He discovered a solution to the conundrum was to align himself with a professional tractor pulling team and devote most of his time to that operation.

“Over the last number of months, parts availability has become the biggest issue,” Williams said. “I’m not even taking on any new assembly jobs because I can’t tell a customer I will have his engine together. The jobs I’m taking on are more freshen-ups and possibly easier-to-get-parts types. It’s hard to make a living when you can’t get the

parts or tell the customer a date. The piston companies are telling you eight to 10 weeks, and it makes it a little rough to do anything.

“I recently started building engines for a pulling team. They supply most of the parts, but I have 10 big Brad Anderson blown Hemis that I’m taking care of for those guys, which is a multi-engine tractor team.

“It is definitely making us change our business outlook,” he continued about the parts shortages. “It used to be somebody would call me up and I would say, ‘Sure, I’ll put an engine together,’ without thinking much about it.

“The last new engine I built, it took me three days just to find the connecting rods. I can’t charge my customer three days for me hunting and calling trying to find connecting rods. It has become unprofitable to build engines for them,” Williams said.

“IF IT’S NOT IN THE BOOSTED MARKET, THEN IT IS SOMETHING WE WOULD TURN AWAY. WE WOULDN’T HAVE TIME TO DO IT.”

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Picture: Jim Walle's 1978 Chevrolet Nova. Calvert's Calvert Split Mono Leadlines, Calvert CF Front and CR Rear Shocks. Photo by Dave Mikarek.

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Adam Bolyard of Adam Bolyard Racing in Franklin, Indiana, often accepts jobs based on personal relationships. "If I know people and have done business with them in the past, that is my first priority. If it is for people that I know and like and are pleasant to work with, I take care of them even if I have to go above and beyond on my schedule to make that happen."

Adam Bolyard has been involved in Adam Bolyard Racing for more than 10 years in Franklin, Indiana, and is the sole proprietor of his shop. He bases most of his business on personal reputation.

"Normally, I decide on which ones to accept based on personal relationships," Bolyard said. "If I know people and have done business with them in the past, that is my first priority. If it is for people that I know and like and are pleasant to work with, I take care of them even if I have to go above and beyond on my schedule to make that happen."

"I also try to do more higher-end stuff, so the more exotic or challenging, I like to take those projects on," Bolyard added.

WHEN TO DECLINE A JOB

Nudelman bases his decision to decline a job by the customer's budget. "There are a lot of dreamers," he observed. "The Internet can be your best friend or your worst enemy. They see this stuff that is sold online and want people to compete, but I can't compete with Jasper. We do custom motors, restorations. I do everything from Mercedes to 1970 Mustangs and things like that. I can't do it for five grand, and you have to be careful with what you buy. And who is buying this?"

"I had a mom, dad, and 16-year-old in

here the other day. Dad asked for a true 500-horsepower small block, and I said, '\$15,000 to \$18,000.'

"He was like, 'OK.'

"I said, 'I won't do it. He'll kill himself.' Dad said he would let him drive a Corvette because it doesn't put out as much horsepower.

"I have to be careful. I'm a father. The last

"THE JOBS I'M TAKING ON ARE MORE FRESHEN-UPS AND POSSIBLY EASIER-TO-GET-PARTS TYPES."

thing I want on my conscience is somebody getting hurt by something I built," Nudelman added.

Morris determines his decision based on the engine style, which must be boosted. "It also has to be in the engine platform that we do," he explained. "Third would be price. Sometimes we end up turning away things because we have a high-price threshold. We do high-quality work, we stand behind our work, this is what it costs, and sometimes

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people aren't willing to pay that. Sometimes, it weans people out from that."

Profitability is what determines what Bolyard will accept or reject. "If we can't make money on it, then it's not interesting. It really has to be something you are really passionate about as well. I have a TQ midget to run, and nobody manufactures headers anymore except for Schoenfeld. I'm trying to fix that and produce bigger numbers on the dyno. I'm doing that right now, and I'm trying to figure it out and hope to sell some."

PRESERVING CUSTOMER RELATIONSHIPS

Telling a customer the reasons for declining a job may be awkward, but Nudelman explained his approach. "I have to be honest and say, 'I don't have the time unless you want to wait. I can't do what you want, so I have to be honest. If you are

looking for a rebuild with Edelbrock heads and all these pieces that add up, if I can't make a profit on it, I can't do it.' It's being straightforward and honest. I'll tell them, 'If you find something on the Internet, that might be the way to go.'"

"We can be super nice about it, and if it is not in our wheelhouse, in the normal

"IF WE CAN'T MAKE MONEY ON IT, THEN IT'S NOT INTERESTING."

threshold of what we do, I just tell them that," added Morris. "If somebody wants me to do a normally aspirated Olds 455 for his 1970 442, a stock rebuild, I'm sorry, that's just not in our

Supply chain issues have impacted Steve Morris Engines of Muskegon, Michigan. "We are currently waiting on parts and have some 20-odd jobs waiting on parts to finish," said Morris (not pictured).



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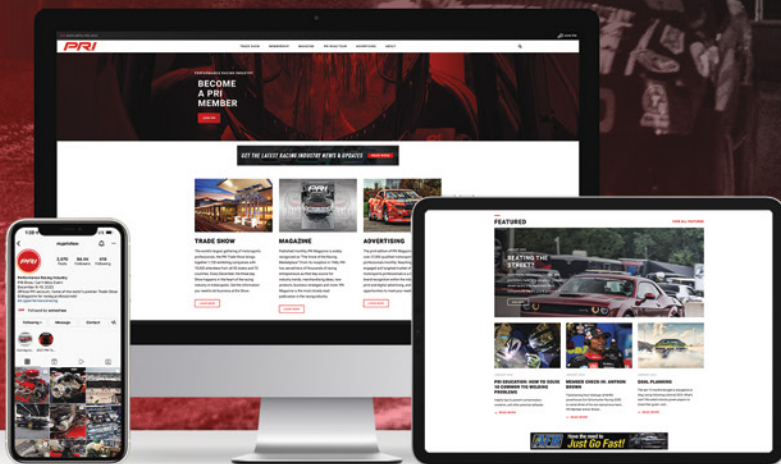
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wheelhouse. If we did do that, it would be very expensive because that is not the platform that we do," again, pointing to his main niche, boosted engines only, 1,000 hp and above.

However, Williams said, "So far, that hasn't been an issue because they understand. Most of the people who are interested in building an engine of this caliber are fairly professional themselves. They know we are all facing these problems in every industry. I haven't had any grief from them. I just tell them it's unprofitable to do it.

*"ALWAYS BE
PROFESSIONAL
IN HOW YOU
COMMUNICATE OR
DECLINE A CERTAIN
CUSTOMER OR
PROJECT."*

"I'm just not accepting any new jobs at this time," he continued, but he added, "check back later. If they want me to do the machine work and they put them together, that's fine. But I'm not just doing the assemblies."

Bolyard admitted, "Normally, you can tell pretty early in the conversation or process if you want to take on a job. If I don't want it, maybe it's not profitable, or it's for a customer who is difficult to deal with, then I price them out. I price them so high you know they will turn it down, and then you kindly send them on their way.

"I like to deal in higher-end clientele," he continued. "You get better classes of people who don't bark at you about price. I'm pretty expensive, my rates are pretty high, but I do neat work and the quality is there. Higher-end customers want the quality.

"It's not about the money, it's about the product," he added.

SHARING ADVICE

Our sources offered their advice to other racing businesses about how to politely decline work.



In addition to his race chassis work, Adam Bolyard is developing headers for his three-quarter midget. "I'm trying to produce bigger numbers on the dyno and hope to sell some," he said.

"Be honest," said Morris. "If it's not in your wheelhouse, it's not in your wheelhouse. I'm a big proponent of, 'This is what we do.' I try to stay in my lane as much as possible. I don't do mod motors because other people do a great job with it, and I don't have the manpower or resources to do it and recommend they go somewhere else. I send the work that they do away to them, and they should send the work they can't do to us when it fits our platform."

"Everybody has to look at their own individual situation," advised Williams. "You have to do what you have to do to make a living. Everybody knows the cost of living is going up. Everything is going up, so you have to make as much money as you can."

"The Saturday night sportsman racers are generally not your best customer to make money because they are scrounging around for every dime that they can. My outlook is, do a really good job and go for a pro series team with a big budget. If you do a real good job and get picked up by somebody like I did, you can make your living that way."

"I found a pro team and work on a salary. I don't have to spend all day searching for stuff," concluded Williams.

"Don't burn any bridges," said Bolyard. "Always be professional in how you communicate or decline a certain customer or project. Sometimes, you can price it right to where it won't make sense. There are ways to decline someone without insulting them." **PRI**

SOURCES

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RACE CAR CLUTCH SELECTION

Choosing the optimal part can be a daunting task, but this guide provides racers with the knowledge they need to make the right purchase the first time around.

By Trent McGee

Selecting the right clutch for your build can be challenging. With so many clutch options on the market today, it can be tough to know which clutch is the best for your race car and driving style. Clutches aren't a one-size-fits-all product, and as such, work best when appropriately paired with the vehicle's intended use.

To help consumers make an informed decision and get the most out of their three-pedal vehicle, we put together a guide to take some of the guesswork out of what could be a daunting task.

TYPES OF CLUTCHES

The most significant differences in clutches are the type of friction disc material and the number of discs used. Depending on the application and horsepower numbers, various clutch disc materials can be used to handle different power outputs, absorb more heat, and take the abuse thrown at them. The clutch disc is also responsible for delivering a

When upgrading to a performance clutch, the most important factors to consider are the intended use of the vehicle and the racer's driving style. You should also take into account the vehicle's weight, horsepower, and torque numbers.

smooth application of power when the clutch is transitioning from disengaged to engaged.

The main types of friction materials used in today's performance clutches include:

Organic: This material is often used for daily driving and stock/OEM replacements for smooth engagement and longevity.

Heavy-Duty Organic: This material is ideal for most performance applications and heavy-duty uses, such as autocross and road racing categories. The disc can typically engage more smoothly while handling higher temperatures with this premium material.

Segmented Friction Configuration: This option uses a segmented design to increase pressure per square inch. The design, in conjunction with organic materials, offers great on- and off-track performance, making it an ideal combination for street/strip and street/track applications.

Ceramic/Metallic: This material is ideal for most racing applications—including drag racing, or big power off-road racing vehicles—as it is designed for repeated clutch engagements and high heat.

SINGLE OR DUAL-DISC CLUTCHES?

Dual-disc clutches handle more power. As their name implies, dual-disc clutches use two discs instead of one. The additional disc allows them to have a significantly higher torque rating, which makes dual-discs attractive for significantly modified diesel trucks, sports cars, drag race cars, or other vehicles with major torque and horsepower.

There are some characteristics of dual-disc clutches to consider before opting for one, however. The significant increase in torque load ratings can sometimes come at the cost of drivability. Smaller dual-disc clutches have a more "on-or-off" feel, making them "grabbier" and more challenging to



Dual disc clutches allow for a higher torque rating than a single disc clutch; it's important to note, however, that this significant increase in torque load ratings can sometimes come at the expense of drivability.

use. Feathering the clutch on race-style dual-discs can be more difficult, and smoothly driving in heavy traffic or taking off from stops is almost impossible.

This is why some manufacturers employ designs meant to reduce drawbacks, making dual-disc clutches a suitable option for race vehicles that also drive on the street.

HOW TO FIND THE RIGHT CLUTCH FOR YOUR APPLICATION

Many motorsports enthusiasts opt for three-pedal cars for a variety of racing disciplines, and having the correct clutch to match the vehicle's intended use makes all the difference. This clutch guide is designed

While drivers of autocross and road course vehicles—including the vintage build pictured here—set up their cars in different configurations and horsepower levels, typically they should be steered toward economical, high-quality twin-disc clutch systems.



to help determine clutch selection for manual transmission motorsports and what to look for in a clutch:

Stock Replacement: Most single-disc, entry-level clutch kits in this category feature high-quality friction materials ideal for applications with stock engines or mild power increases from bolt-on modifications. It provides much-needed increased holding capacity while still allowing light pedal effort and smooth engagement.

Off-Roading: For truck and off-road applications—or any application with added weight or mild performance modifications—look for products that offer superb holding power and a light pedal feel, such as full facing discs and pressure plates with centrifugal weights. Typically, weight is the enemy in racing, but in this category, the added weight of a high inertia billet steel flywheel can offer more resistance to stalling at idle and can keep the engine running at lower rpm's.

Street/Strip: If driving to and from the race track is your goal, look for a pressure plate and disc combination that offers ultimate holding power and performance without sacrificing pedal effort and driver control.

Circle Track: In circle track—and other applications where weight savings is key—look for a single-disc clutch specifically designed to offer lightweight, low-inertia performance and reduce engine rotating mass. One example is the Light Metal Clutch by Centerforce, which features pressure plates machined from high-strength aircraft-grade billet aluminum with a unique heat-treated replaceable friction surface.

Road Course/Autocross: Autocross and road course racers build their vehicles in different configurations and horsepower levels, but whether the build is wild or mild, many autocross enthusiasts succeed with economical, high-quality twin-disc clutch

systems. Look for discs that utilize solid hubs to reduce the rotational weight on the input shaft for quick and clean shifts, making a significant difference on the autocross track.

Drag Racing: Drag racers who make big power need the best holding capacity to transfer power to the ground. Not to mention, drag car components need to handle the high temperatures caused by the repeated high-power cycles. This is why a premium, dual-disc clutch system is recommended for drag racing applications. There are a few different options in this category, but systems typically feature a pair of segmented discs with premium, organic friction material capable of holding up to 1,600 lbs.-ft. of torque. Many options can still retain a soft pedal feel and remain streetable.

While this guide should help you consider your available options, be sure to consult with your manufacturer or builder to find what's best for your race vehicle. **PRI**

Trent McGee is the marketing manager at Centerforce Clutches in Prescott, Arizona, and has been a freelance contributor to various automotive enthusiast publications for more than 25 years. Though his interests include anything that runs on gas, he is an avid off-road enthusiast and spends much of his time exploring backcountry trails all over the Southwest.

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ADVOCACY CORNER

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

Edited by Laura Pitts

PRI race track ambassador Tom Deery and the Washington, DC-based advocacy team work continuously to protect and promote tracks, sanctioning bodies, and motorsports businesses around the nation. This month, we are tracking several initiatives that affect racing, including a new resource to help enthusiasts identify the elected officials that support motorsports; why tracks and sanctioning bodies should host lawmakers; a resource for businesses seeking talented new employees; and more.

RESOURCE CENTER: VOTE RACING IN NOVEMBER

The Performance Racing Industry (PRI) enhanced Save Our Racecars initiative is aimed at further promoting and protecting one of America's oldest pastimes and hobbies: motor vehicle racing.

The program is highlighted by a redesigned website (SaveOurRacecars.com) that streamlines the process for industry professionals, enthusiasts, and fans to join the fight to preserve racing. Included is an all-new "Vote Racing" program to help facilitate voter registration while highlighting pro-racing candidates in the November midterm elections. Visitors will also find template letters, phone scripts, and other resources designed to streamline outreach to lawmakers.

Critical to the industry's future—and central to PRI's advocacy efforts—is the Recognizing the Protection of Motorsports (RPM) Act of 2021 (H.R. 3281/S.2736), which must be enacted into law to protect the right to modify street cars, trucks and motorcycles into dedicated race vehicles. Supported by PRI and SEMA, the RPM Act aims to protect Americans' right to convert street vehicles into dedicated race cars and the motorsports-parts industry's ability to sell products that enable racers to compete.

"SaveOurRacecars.com makes it easy to do your part to protect racing and identify whether your lawmakers in Congress support the RPM Act. With the November midterm election only months away, it's important

that racers and everyone who works in the industry consider whether their member of Congress has supported racing when they cast their vote," said Eric Snyder, PRI's Director of Congressional Affairs. "An informed racing community that holds their lawmakers to account is a powerful force in

the campaign to pass the RPM Act into law." Visit saveourracecars.com/vote-racing.html for a list of the 150 federal lawmakers and candidates who have either signed on as co-sponsors or expressed support for the RPM Act.

CONGRESSMAN'S FORMULA DRIFT VISIT HIGHLIGHTS OUTREACH OPPORTUNITIES

Congressman Frank Pallone (D-NJ)—one of the most important and influential lawmakers in Washington, DC, on the Recognizing the Protection of Motorsports (RPM) Act—showed his support for the motorsports community



New Jersey Congressman Frank Pallone recently attended the Formula Drift event at Old Bridge Township Raceway Park in Englishtown, New Jersey. Rep. Pallone is chairman of the US House Energy & Commerce Committee, which has jurisdiction over the Recognizing the Protection of Motorsports (RPM) Act. Pictured above, from left, are PRI GM Jim Liaw, Rep. Pallone, PRI Director of Congressional Affairs Eric Snyder, and PRI VP of Government and Legal Affairs Daniel Ingber. Below, Rep. Pallone takes the wheel of a Formula Drift car.



by attending the recent Formula Drift event at Old Bridge Township Raceway Park in Englishtown, New Jersey.

Rep. Pallone is Chairman of the US House Energy & Commerce Committee (E&C), which has jurisdiction over the RPM Act. His support is critical to the motorsports industry, and for efforts to pass the bill in 2022.

The RPM Act (H.R. 3281/S.2736) is bipartisan legislation that would protect the future of racing by clarifying in federal law that it is not illegal to modify and convert a street vehicle into a dedicated race vehicle. The House and Senate must pass the RPM Act by January 3, 2023, in order for it to become law during the 117th session of Congress.

“As Chairman of the Energy & Commerce Committee, Rep. Pallone runs the committee and sets its agenda. His visit to Formula Drift was especially important because he saw, firsthand, the professional drivers that compete in race cars that the EPA currently deems illegal,” Snyder said. “Chairman Pallone understands the importance of the RPM Act to the future of racing and to the thousands of people who make and sell products that are used on the track.”

PRI encourages businesses and tracks to work with the PRI Government Affairs team to host federal and state lawmakers. Congressional visits are critically important to educate policymakers on racing and the businesses and communities that it supports.

“It’s important that race tracks educate lawmakers on the important role they play in providing family-friendly entertainment in their communities,” Snyder said. “I can’t think of a better way to do that than to host your members of Congress and state lawmakers at the track so they can see what racing is all about for themselves.”

If you would like to get to know your members of Congress, the PRI team is ready to help and provide the heavy lifting. PRI will draft an invitation, identify and contact the appropriate lawmakers, and provide a briefing and day-of logistics prior to the event. For additional information, contact Eric Snyder at erics@sema.org.

For more on the RPM Act and how to contact your federal representatives, visit saveourracecars.com.

EMPLOYERS ENCOURAGED TO UTILIZE PRI CAREER CENTER

PRI’s interactive job board, the PRI Career Center, offers PRI Members and the entire racing industry an easy-to-use and highly targeted resource for online employment connections.

Employers can use the PRI Career Center to reach qualified candidates. PRI Members can post open jobs, search for suitable candidates based on the specific job criteria, find online reports for job activity statistics, and create an online resume agent to email qualified candidates daily—all at no cost.

Employers that are not PRI Members can also use the service—and access a directory of automotive motorsports professionals—for a nominal fee. Over 1,600 searchable resumes were available at press time, with about 350 average views per job listing.

“The PRI Career Center allows job seekers and employers to access a collection of job opportunities focused solely on the racing industry. We’re proud to offer this service for motorsports businesses now more than ever as companies work to find and retain quality employees,” said Dr. Jamie Meyer, PRI President. “The PRI Career Center is the best, most effective way to ensure you get candidates that align with the passion and excitement found only through motorsports.”

There are also several add-on options for employers, including the popular single 30-day online job posting package, which includes full resume search access and automotive career network distribution.

Additional resources include branding solutions, automated bulk posting options, employer resources such as articles and videos on government compliance, a look at “the candidate experience,” and tips on how to attract top talent. Job posting enhancements are also available, including featured jobs, job posting videos, and social media recruiting. Employers can also distinguish themselves with a Featured Employer brand profile page, banner ad, and enhanced job postings.

For more information, including how to register for the PRI Career Center and search for jobs, visit jobs.performanceracing.com.

AUTOMOTIVE SPECIALTY-EQUIPMENT SALES RISE TO \$50.9 BILLION

Sales of specialty-equipment parts reached a new high in 2021, increasing to \$50.9 billion in retail sales for the first time in history—up from \$47.9 billion in 2020.

The finding comes from the new “2022 SEMA Market Report,” which is available for download at sema.org/research and provides the automotive aftermarket industry with a comprehensive review of the specialty-equipment market in 2021. The report includes new data on the US market size, consumer profiling, industry trends, and changes in the vehicle population.

SEMA estimates that the growth was driven by strong consumer interest in working on their car or truck, as more than 80% of specialty-equipment consumers reported spending as much, if not more, time working on their personal vehicles as they did during 2020.

“The 2022 SEMA Market Report can help member companies identify key areas of interest for consumers, and where the most money was spent on parts in 2021,” said SEMA Director of Market Research Gavin Knapp. “As our biggest research report of the year, this is a must-read for any business owner who wants to make strategic, data-driven decisions.”

Restrictions on in-person shopping eased in 2021, prompting consumers to become more comfortable going back into stores to buy parts. As a result, the split of in-store versus online sales in 2021 was roughly 50/50—versus 54% online in 2020, and 45% online in 2019. This normalization is expected to continue in 2022.

Pickup trucks remain the single biggest segment in the specialty-equipment parts market. An estimated 13.6 million pickups were modified by consumers in 2021, accounting for a combined 31% of specialty-equipment parts sales.

Ongoing supply chain issues are also a concern in 2022. More than 90% of specialty-equipment manufacturers, distributors, and retailers feel that supply-chain-related challenges have impacted their business. This, in turn, is softening expectations regarding 2022 sales.

For more information, visit sema.org/research. **PRI**

INDUSTRY NEWS

SPEEDWAY MOTORSPORTS FOUNDER BRUTON SMITH, 95

Ollen Bruton Smith, the founder and executive chairman of Speedway Motorsports and Speedway Children's Charities based in Concord, North Carolina, has passed away at 95.



Bruton Smith

A member of the NASCAR and International Motorsports Halls of Fame, Smith founded Speedway Children's Charities in 1982 in memory of his son, Bruton Cameron Smith, who passed away at a young age.

In 1994, Smith founded Speedway Motorsports, the first motorsports company to trade on the New York Stock Exchange. Today, the company owns and operates 11 motorsports entertainment facilities along with subsidiaries like U.S. Legend Cars International and zMAX Micro Lubricants.

In 1997, Smith founded Charlotte, North Carolina-based Sonic Automotive, an automotive retailer company.

PROMINENT TRACK PROMOTER JODY DEERY, 97

Jody Deery, the longtime promoter at Rockford Speedway, has passed away at 97. Deery is the mother of PRI Track Ambassador Tom Deery.



Jody Deery

In 1966, Deery and her husband Hugh became the sole owners of Rockford Speedway, the 1/4-mile asphalt short track in Loves Park, Illinois. They launched the National Short Track Championships, an event for full-bodied stock cars that continues today.

Following Hugh's passing in 1984, Deery became one of the first women to solely operate a racing venue in the US. She

officially retired from day-to-day duties at the track in September 2020.

Prior to her retirement, Deery became the first woman to win the "Auto Racing Promoter of the Year" award in 1994. She had also served on the nominating committee for the NASCAR Hall of Fame and the voting panel for inductees since 2013.

NORWALK TRACK OWNER- OPERATOR BILL BADER SR., 79

Bill Bader Sr., who helped transform Summit Motorsports Park (Norwalk, Ohio) into a fan-favorite facility, has passed away due to injuries sustained in an accident near his home. He was 79.



Bill Bader Sr.

Bader bought Summit Motorsports Park (formerly Norwalk Dragway) in 1974 and managed it until 1998, when he turned over control to his son, Bill Bader Jr., and briefly assumed the presidency of the International Hot Rod Association (IHRA). The track hosted its first National Hot Rod Association (NHRA) event in 2007.

MAXIM CHASSIS FOUNDER CHUCK MERRILL, 78

Chuck Merrill, the founder of Maxim Chassis based in Springfield, Illinois, has passed away at 78.

Merrill founded the sprint car chassis design and engineering company in 1988. By June 1989, the company had grown to six employees in a 7,000-square-foot facility. Maxim Chassis is perhaps best known for the development of the Kinser Lightweight Standard (KLS) or K-car, which changed the standards of sprint car racing, according to the company.

RWB ACQUIRES CORSA PERFORMANCE, VOLANT PERFORMANCE

Mentor, Ohio-based Race Winning Brands

(RWB), a portfolio company of MiddleGround Capital, has announced the acquisition of CORSA Performance, CORSA Performance Marine, and Volant Performance.

CORSA Performance is based in Berea, Ohio, and specializes in performance exhaust systems, cold air intake systems, and related accessories. CORSA Performance Marine offers marine-specific exhaust systems and components. Volant Performance, also based in Berea, focuses on cold air intakes and filters for various applications.

The three businesses—which bring RWB to 16 add-ons since its inception in 2017—will continue to operate from their respective locations.

TRACK ENTERPRISES TO ACQUIRE ARCA MIDWEST TOUR

Macon, Illinois-based Track Enterprises has reached an agreement to acquire the regional ARCA Midwest Tour Super Late Model series at the end of the 2022 race season, as announced by Track Enterprises President Bob Sargent and ARCA's Gregg McKarns.

The announcement follows Track Enterprises' acquisition of the Champion Racing Association (CRA) in January.

Gregg and Angie McKarns will continue to promote and operate Madison International Speedway in Oregon, Wisconsin; Angell Park Speedway in Sun Prairie, Wisconsin; and the Oktoberfest Race Weekend at La Crosse Fairgrounds Speedway in West Salem, Wisconsin.

SUMMIT RACING EQUIPMENT ACQUIRES NICKELS PERFORMANCE

Transtar Holding Company has announced the sale of Kansas City, Missouri-based Nickels Performance to Summit Racing Equipment, the global retailer of performance and replacement automotive parts and accessories headquartered in Tallmadge, Ohio.

According to a release, Nickels Performance will continue to operate as a

wholesale distributor of high-performance racing parts under its current brand name.

BOSCH PLANS TO PURCHASE THE MOTEC GROUP

Bosch Engineering GmbH, the manufacturer of electronics for automotive and other applications based in Abstatt, Germany, plans to acquire MoTeC Group, headquartered in Melbourne, Australia.

Following approval, MoTeC will become an integral part of Bosch Motorsport, a business unit of Bosch Engineering GmbH, but will continue to operate as a separate entity under its own brand. The acquisition is expected to allow Bosch Motorsport to extend its product portfolio and distribution.

NEW OWNERS FOR LANCASTER (NY) TRACK

Lancaster National Speedway, the motorsports facility in Lancaster, New York, has been purchased by a group of investors headed by drag racer Mike Swinarski and stock car driver Scott Nurni. The track was formerly owned by Gorden Reger.

The 77-acre auto racing complex—which includes a 1/2-mile asphalt oval and a 1/8-mile drag strip—has been renamed Lancaster Motorplex.

RED BULL ANNOUNCES PRODUCTION HYPERCAR

Red Bull has announced its first in-house hypercar project—the RB17—with a limited run of 50 cars to be built at Red Bull Advanced Technologies' campus in the United Kingdom. Production is set to begin in 2025.



Powered by a V8 hybrid engine, the vehicle is currently anticipated to produce over 1,100 bhp, with the two-seat hypercar designed around a carbon-composite tub.

GOLD EAGLE ANNOUNCES ACQUISITION OF LSI

Gold Eagle Co., a family-owned and ISO 9001-certified manufacturer based in Chicago, Illinois, has acquired Lubrication Specialties Inc. (LSI).

Mount Gilead, Ohio-based LSI makes several fuel and oil products for the automotive industry, including the Hot Shot's Secret brand line. Currently, there are over 50 products, fuel and oil additives, specialty oils, coolants, and fluids, that make up the Hot Shot's Secret line. The merger will not lead to downsizing or significant changes for the LSI team, the companies announced, adding that all 71 employees will retain their respective roles.

BMW UNVEILS LMDH PROTOTYPE RACE CAR

Ahead of the testing phase for the LMDh prototype for the 2023 season in the IMSA WeatherTech SportsCar Championship, BMW M Motorsport has announced its new prototype car.



The BMW M Hybrid V8 includes a wide kidney design, twin NMW icon lights, dynamic body sides, Hofmeister kink window graphic, and hook mirrors and taillights.

SUPERSPRINGS INTERNATIONAL NAMES ADAM WEISNER PRESIDENT

SuperSprings International, the manufacturer of suspension solutions and products based in Carpinteria, California, has named Adam Weisner as its new president.

Formerly chief commercial officer, Weisner will now oversee the company's five business units and run day-to-day operations. He will report to CEO Gerry Lamberti.

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LORI COLLIER WARAN NAMED RICHMOND RACEWAY PRESIDENT

Richmond Raceway, the 0.75-mile, D-shaped asphalt race track in Richmond, Virginia, has named Lori Collier Waran as its new track president.

Waran previously served as the chief revenue officer and associate publisher at Virginia Business Magazine + Media.



Lori Collier Waran

Prior, Haynie served as CEO for Pinpoint, an analytics business based in Mountain View, California.

AWE PROMOTES DANE PELLICONE TO ENGINEERING MANAGER

AWE, the precision engineering and manufacturing firm located outside Philadelphia, Pennsylvania, has promoted Dane Pellicone to engineering manager.

Pellicone has been with AWE for almost 15 years, most recently as a senior engineer since 2014. Prior, he was an engineering associate for six years; before that, he was a metal fabricator.

president of Marketing.

In addition, Bruce Hendel is now senior vice president of Global Sales.

Most recently serving as the division manager of Consumer Products, Andy Deel has been named director of Consumer Products.

Richard Gladly, meantime, has been promoted to director of Sales for the Lubricants Division. He was previously sales manager for that division.

SCORE NAMES NEW MARKETING SALES MANAGER

SCORE International Off-Road Racing, the off-road racing sanctioning body based in Ensenada, Baja California, Mexico, has appointed Kurt Miller to the newly created role of marketing sales manager.

Miller most recently served as the director of Marketing and Sales for Westin Automotive/Superwinch. Previously, he was a key accounts manager for Mickey Thompson Tires and Mickey Thompson Entertainment Group (MTEG).

MATTHEW BOTOS JOINS DEI AS LEAD ENGINEER & DESIGNER

Avon Lake, Ohio-based Design Engineering, Inc. (DEI) has announced Matthew Botos as its new lead engineer and designer.

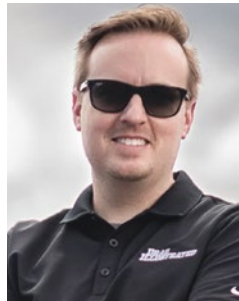
With previous experience in mechanical engineering, computer aided design (CAD), computer numerical control (CNC) machining, and information technology (IT), Botos will help design new products and improve current ones, the company said.



Matthew Botos

MIKE CARPENTER NAMED COO OF DRAG ILLUSTRATED

Drag Illustrated Media has announced Mike Carpenter as its new chief operating officer (COO). He will oversee the day-to-day operations across print and digital platforms.



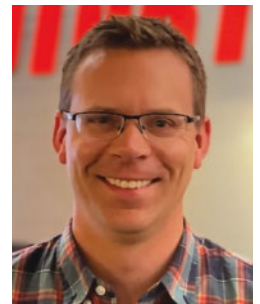
Mike Carpenter

Carpenter will also continue in his role as design and production director for the magazine, oversee Drag Illustrated-promoted races, and co-host and produce the Wes Buck Show stream and podcast.

AUTO MEDIA VETERANS JOIN MOTORTREND GROUP

El Segundo, California-based MotorTrend Group, which specializes in enthusiast brands including Motor Trend, Hot Rod, and Roadkill, has named Eric Tingwall as testing director while Mike Galimi has joined as HOT ROD network director.

Tingwall will lead MotorTrend's vehicle testing team and oversee all testing, data collection, and related reporting. Galimi will guide the editorial direction of HOT ROD including video content and online, print, and social media platforms.



Eric Tingwall



Mike Galimi

SHOPMONKEY NAMES NEW CHIEF TECHNOLOGY OFFICER

Shopmonkey, the cloud-based auto shop management platform based in San Jose, California, has announced Jeff Haynie as its new chief technology officer.

Haynie will focus on scaling existing capabilities and adding new security features. He will also help develop Shopmonkey's ability to leverage analytics and machine learning to improve the performance of its software development efforts.

VP RACING FUELS ANNOUNCES PROMOTIONS

VP Racing Fuels, the provider of racing and performance fuel products and branded retail based in San Antonio, Texas, has announced that Karen Madden has been promoted to chief operating officer. Most recently vice president of Branded Retail, Madden will assume responsibility for VP's three manufacturing, warehousing, and shipping facilities in Texas and Tennessee.

Assuming the role of vice president of Branded Retail is Ben Dolan, who most recently served as VP Racing Fuels' vice

M&C ANNOUNCES NEW COMMUNICATIONS & TRAFFIC MANAGER

Martin & Company (M&C), the full-service automotive aftermarket marketing solutions firm based in Whites Creek, Tennessee, has named Melanie Henry as its new communications and traffic manager.

Most recently, Henry was creative marketing manager for Red Goat Marketing, an automotive marketing company.

BRIDGESTONE OPENS SUSTAINABLE RACE TIRE PRODUCTION FACILITY

Bridgestone Americas has opened its new Advanced Tire Production Center (ATPC) in Akron, Ohio, to make all Firestone Firehawk race tires for the NTT IndyCar Series.

The 80,000-square-foot facility features "state-of-the-art manufacturing technologies designed to help advance innovation in race tires," the company stated, and will also manufacture small batches of specialty prototype tires for testing and development.

TOYOTA GR CUP TO DEBUT UNDER SRO BANNER

Beginning in 2023, SRO America will sanction the new, single-make racing series, the Toyota GR Cup, recently announced by Toyota Gazoo Racing North America (TGRNA). SRO America is a division of SRO Motorsports Group based in London, UK.

MBE GROUP HIRES NEW ACCOUNT COORDINATOR

Marx Buscemi Eisbrenner Group (MBE Group), the full-service marketing communications agency, has hired Gretchen Bennett as an account coordinator.

Bennett, who will support account teams with social media content development, news release writing and distribution, media relations, research, and more, will be based out of MBE Group's Bloomfield Hills, Michigan, office.

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



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DESIGN ENGINEERING, INC. designengineering.com

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Contact: 800-264-9472



EARL'S PERFORMANCE PLUMBING holley.com/brands/earls

Earl's Vapor Guard fuel filters free flow 125 GPH and are rated up to 100 psi of pressure. The bronze element can withstand modern pump gas as well as diesel fuels, and its usable/replaceable design means users don't need to purchase new filters when switching from carb to EFI.

Contact: 866-464-6553



IMPACT RACING ximpactusa.com

The Impact Axis suit was designed with the value-conscious racer in mind. Manufactured from fire-rated, 100% Aramidic fabric, it's rated to the SFI 3.2-A/5 standard, making it legal for competition in most series and classes. The Aramidic fabric makes for a lightweight and breathable suit, and it's available in standard colors.

Contact: 317-852-3067



JENVEY jenvey.co.uk

The Porsche Air-cooled Heritage kits feature the advantages of modern electronic fuel injection paired with a retrospective exterior design. Jenvey offers these kits for the two-bolt engine with 35-mm and 39-mm port sizes married to a 42-mm and 45-mm throttle body, respectively.

Contact: +44 (0)1746 768810



MANLEY PERFORMANCE manleyperformance.com

Manley has expanded its line of Extreme Duty valves, which were developed for supercharged, nitro-burning engines and manufactured from the company's unique XH-432 XtremeAlloy (Inconel material and proprietary heat-treat process). Other attributes include swirl polishing, chrome stems, and hard tips.

Contact: 732-905-3366



MELLING ENGINE PARTS melling.com

Melling's camshaft is designed for Ford 6.7L OHV turbo diesel engines, including F250SD, F350SD, F450SD, F550SD. Part number MC1428.

Contact: 517-787-8172



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Diamond Honing Tools for GH8 Guide Honing Machine :-

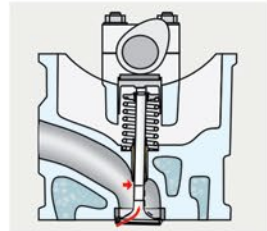
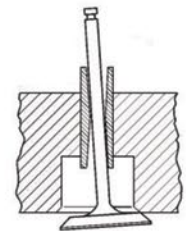
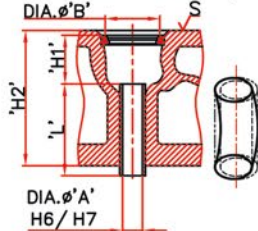
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INSPECTION GAGES / Measuring devices:- (Robins-First)

- Measure guide bore-dia. & taper within 0.002mm.
- Measure bore "Circularity" within 0.002mm.
- Measure "Cylindricity" below 0.002mm / 50mm 'L'

'UNDERSTANDING VALVE GUIDES & TOLERANCES'

(Specifications most O.E.M'S use)



Standard Valve Stem To Guide Clearances

Valve Stem Diameter	Intake Valves	Exhaust Valves
5 - 7mm	10 - 40 μm	25 - 55 μm
>7 - 9mm	20 - 50 μm	35 - 65 μm
>9 - 12mm	40 - 70 μm	55 - 85 μm

'Valve Guide Machining Tolerances'

Dia. Ø 'A'	SURFACE FINISH	CIRCULARITY (Roundness)	CYLINDRICITY (Straightness & Roundness)
GUIDE BORE TOLERANCE (Ø 6-10mm) H6 DIA 'A' -0.000 +0.009 mm (0.00035") or H7 DIA 'A' -0.000 +0.015 mm (0.0006")	0.8 Ra μm • 32 Ra μm • 0.8 CLA • 5.7 Rz ISO • 0.9 RMS	0.006 mm (0.00025")	0.005 mm / 50 mm L (0.0002" / 2" L)

In case of air-cooled cylinder heads and high-performance engines, due to the higher thermal load - the upper range of the clearance tolerance is aimed for.

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- Valve seats - "accuracy & finish" - depend on valve guide precise tolerance.

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moroso.com

Moroso offers Ultra 40 sleeved ignition wire sets with 135-degree spark plug boot for GM LS applications. These wire sets are available with either 8- or 9.75-inch wire lengths. Sleeving also adds extra dielectric strength, which allows the wire to withstand outside electrical pulses.

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scegaskets.com

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Contact: 800-GASKET-0



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wilwood.com

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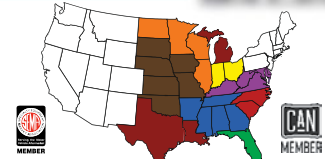
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SOCIAL STATUS

A closer look at racing and performance industry members' winning sales strategies on Instagram, Facebook, and more.

Instagram Shop offers brands a way to sell products directly through Instagram, allowing companies to expose their goods to a wider group of potential customers and drive more product sales and/or traffic to the company's website. Additionally, "the Instagram Shop feature allows a company to tag products on their videos and images to send those clicks to their online shop/website, or to shop through Instagram directly," noted Crystal Covarrubias from FiTech in Riverside, California. "Instagram ads can also direct to your Shop."

FiTech started using the feature in late 2020. "We recognize that social media has a large impact on e-commerce and customer behavior, so we wanted to allow the customer to easily find the products that are catching their attention on our media platforms," Covarrubias explained. "Utilizing the Shop feature also allows current customer photos to be displayed in our shops where people can see how much our existing customers are enjoying our product."

To get started with an Instagram Shop, your business must be eligible by meeting certain requirements. They include:

your business is located in a supported market, has eligible products, complies with Instagram's merchant agreement and commerce policies, and owns a website domain where you intend to sell from. You must also have a business account on Instagram, and be connected to your Facebook page. Then, you would simply upload your product catalog and submit your account for review. When your account is approved, you can then turn on the shopping feature.

"One of my favorite benefits of the Shop feature is the amount of exposure to non-followers we can develop," Covarrubias said. "These non-followers that were brought in through a photo/video can be converted into potential customers because of the post we made with a product tag. Currently, about half of our Shop visitors are non-followers. Not to mention that the Instagram algorithm will target your customer demographic through the post alone, which is why we tag a product whenever we can."

The Instagram Shop tab offers even more ways for your brand and products to get noticed. This tab, which is found on Instagram's home screen, serves as a destination for people to discover new

brands, products, and Editor's Picks that are personalized to them.

"Currently, we use the Shop feature to direct people to our website in order to provide more information, product options, and product support rather than shopping through Instagram directly. For this reason, Instagram Shop is used as a website traffic source rather than a purchasing source in our application," Covarrubias noted. However, Instagram Shop can be used congruently as a purchasing source and a means to direct people to the company website.

Covarrubias highly recommends the Instagram Shop feature for businesses, provided they're eligible. "While looking at our insights/analytics, we've seen a number of people that were not yet following our page but visited our store due to an image/video that caught their attention, and some of these visitors became consumers of our product. Not to mention how easy it is to integrate this method into your day-to-day social posting. You're advertising your product without using outdated, in-your-face advertising tactics," she explained.

Look at it this way: The Shop feature is your storefront on Instagram. **PRI**



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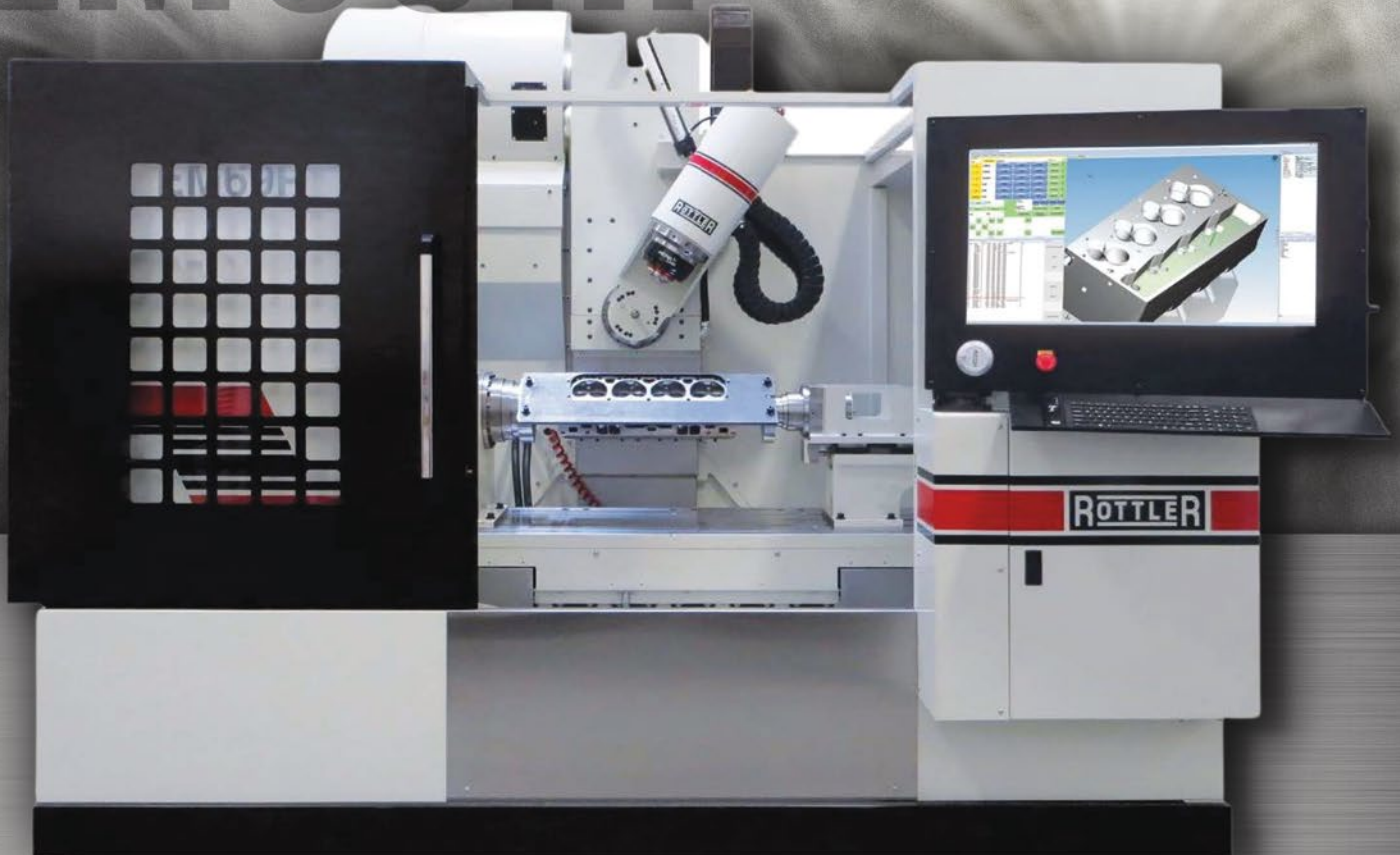
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