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Jef White
Editor
www.theshopmag.com

Gen Z: America's Next Generation of Car Collectors

It's a topic that comes up consistently in the specialty automotive aftermarket, but new data again confirms that, yes, younger generations remain interested in specialty and collector vehicles.

Hagerty's 2024 "Future of Driving" survey indicates a strong and growing affinity for collector cars, trucks and motorcycles among Gen Z, defined as those born between 1997 and 2012. While nearly half (47%) of the respondents surveyed noted an interest in owning a classic car, Gen Z expressed significantly greater interest at 60%, compared to 31% of baby boomers.

"The next generation of car enthusiasts is here, creating a vibrant market for us to help enthusiasts protect, buy, sell and enjoy their special vehicles," said McKeel Hagerty, CEO and chairman of Hagerty. "The data is clear that Gen Z isn't just playing car video games, watching YouTube or creating social media content—they're also finding ways to participate in the collector car community."

Hagerty commissioned the international market research agency OnePoll (Talker Research) to survey more than 2,000 Americans about the role cars play in their lives, their behaviors tied to cars and driving, and more.

Key findings include:

- *Driving Is Alive & Well:* Results show 77% of Gen Z respondents said they either loved or liked driving, indicating a promising future not only for the auto industry but also for the collector car community.
- *Craving Classic Ownership:* Respondents shared that they have either owned or currently own a classic enthusiast vehicle, with Gen-Z and millennials at 32% and 30%, respectively.
- *SUVs Are Tops:* SUVs are the most popular type of vehicle among respondents (38%), followed by sedans (26%) and pickups (19%). Gen Z, however, expressed nearly equal interest in luxury cars (23%) as it did in SUVs (26%).
- *Emotional Ties:* Half of those who drive said they feel a sense of freedom when driving. Adventurous (28%) and calm (24%) were other top responses, highlighting the emotional connection and psychological benefits associated with the hobby.
- *Do-It-Yourself:* Car owners mostly manage maintenance by taking their car to a dealership or service center (55%). Although 27% said they perform DIY repairs, millennials are the most likely generation to do so at 34%.

The interest in a wide range of cars from the past four decades that younger enthusiasts show is likely due to social media as well as other online and in-person on-ramps to the hobby, Hagerty officials state. Of note, 40% said their first exposure to classic and enthusiast cars was from attending car shows, making them a critical entry point to the market.

Finally, 43% of those surveyed believe that classic cars are an integral part of American history and should be systematically preserved like historic buildings and architecture. Since its founding, Hagerty has sought to keep the unique, dynamic culture that surrounds collector car enthusiasts across the country alive, having invested more than $22 million in preserving the culture for today's generations and those to come. ***TS***

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2024 SEMA SHOW

TIME TO SHINE







More than 2,400 brands are signed up to exhibit at this year's SEMA Show, set for Nov. 5-8. (Far left photo courtesy SEMA)

The Specialty Equipment Market Association (SEMA) is expecting big things at this year's SEMA Show, with more than 2,400 brands signed up to exhibit, including hundreds of new companies unveiling the latest specialty aftermarket products and services.

"The industry continues to innovate, creating new solutions to shape the future of automotive. In turn, this has fueled demand and increased sales, and the tremendous support for this year's SEMA Show is a reflection of the growth and energy of the marketplace," says Tom Gattuso, SEMA vice president of events. "The industry is eager to come together, conduct business and make connections that will result in future success."

A trade event for the specialty automotive aftermarket, the SEMA Show was the number one convention in Las Vegas in 2023, according to the Las Vegas Convention and Visitors Authority's research center, welcoming 160,000 attendees and occupying more than 2.5 million gross square feet of indoor exhibit space.

SEMA looks to build on that momentum in 2024 during the four-day event, set for Nov. 5-8.

In addition to connecting with thousands of leading brands, SEMA Show attendees will experience the world's largest display of new automotive aftermarket products at the New Products Showcase and have the chance to check out the latest vehicle builds along with new activations and areas dedicated to future technology.

Showgoers can also participate in education tracks and seminars, unique events and the show-ending SEMA Fest, a celebration of music and car culture (see page 10).

"With the latest products, leading brands, immersive experiences and thought leaders from every facet of the industry, this is a can't-miss event," says Andy Tompkins, SEMA trade show director. "We're dedicated to providing attendees with an unparalleled experience that will help their business and professional career grow."

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SEMA Fest will close the show on Friday by blending the fun of custom automotive culture with top musical acts, all on the Las Vegas Convention Center grounds. (Photos courtesy SEMA Fest)

- ***Jude Giordano*** (University of North Carolina at Charlotte, Mechanical Engineering)
- ***Noah Gordon*** (Ferris State University, Automotive Engineering & Technology)
- ***James Graham*** (Purdue University – Main Campus, Engineering)
- ***Jaedyn Imhoff*** (California Polytechnic State University – San Luis Obispo, Mechanical Engineering)
- ***Danielle Irey*** (University of Nevada Las Vegas, Sports Medicine, Management & Technology)
- ***Marijan Kruzic*** (St. Philip's College, Automotive Technology)
- ***Kailey Kwilas*** (Purdue University Northwest, Electromechanical Technology)
- ***Jaxon Lappin*** (University of Northwestern Ohio, Automotive—High Performance Technician Diploma)
- ***Austin Leung*** (Central Michigan University, Data Analysis)
- ***Bhavya Mamnani*** (Georgia Institute of Technology – Main Campus, Mechanical Engineering)



The SEMA Memorial Scholarship Fund awarded scholarship and loan forgiveness awards to 46 individuals currently working or planning to pursue careers in the automotive aftermarket industry. Pictured are scholarship winners from last year. (Photo courtesy SEMA)

- ***Zebedee McMenamy*** (Missouri University of Science & Technology, Mechanical Engineering)
- ***Fletcher Meadows*** (Clemson University, Automotive Engineering & Technology)
- ***Sarai Morales*** (Babson College, Business)
- ***Jocelyn Pandolfo*** (Pennsylvania College of Technology, Autobody Collision)
- ***Giselle Pena Cortez*** (Weber State University, Automotive Technology)
- ***Nathan Prettyman*** (Utah Valley University, Autobody Collision)



- ***Christopher Rodriguez*** (University of Alabama, Mechanical Engineering)
- ***Kristy Rubino*** (Southern Illinois University – Carbondale, Automotive Technology)
- ***Aidan Santiago*** (University of Northwestern Ohio, Automotive Technology)
- ***Aleah Sauder*** (McHenry County College, Autobody Collision)
- ***William Schimberg*** (Colorado School of Mines, Mechanical Engineering)
- ***Brendan Schmitt*** (Southern Illinois University – Edwardsville, Business)
- ***Masen Schneider*** (University of North Dakota, Mechanical Engineering)
- ***Ojas Shah*** (University of Illinois Urbana – Champaign, Mechanical Engineering)
- ***Joshua Sites*** (Ohio Northern University, Mechanical Engineering)
- ***Patrick Steinkamp*** (Missouri University of Science and Technology, Engineering)
- ***Cole Van Vlymen*** (Rose-Hulman Institute of Technology, Mechanical Engineering)
- ***Grady Wiggins*** (Florida Institute of Technology, Mechanical Engineering)
- ***Kaitlyn Zubia*** (University of Texas at El Paso, Mechanical Engineering)

SEMA LOAN FORGIVENESS AWARD WINNERS

- ***Chris Apkarian*** (AMS Osram, University of New Hampshire at Manchester, Mechanical Engineering Technology)
- ***Clayton Brown*** (Race Winning Brands, University of Akron Main Campus, Mechanical Engineering Technology)
- ***Elizabeth Busniewski*** (MagnaFlow, Northwood University, Automotive Aftermarket)
- ***Trevor Haunschild*** (Warn Industries, Oregon State University, Mechanical Engineering)
- ***Mark Mollica*** (Thyssenkrupp Bilstein of America, University of San Diego, Mechanical Engineering)
- ***Baily Soto*** (Legacy EV, Arizona State University – Downtown Phoenix, Education)
- ***Luke Voldahl*** (General Motors, Eastern Michigan University, Information Technology)

The online application for next year's awards will open in January 2025. For information, visit sema.org/scholarships.



Kim Pendergast



Melissa Scoles

OUTGOING BOARD MEMBERS

- ***Lindsay Hubley*** – SVP Consumer Events, Emerald X/Overland Expo
- ***Larry Montante*** – VP Category Management, Keystone Automotive
- ***Brian Reese*** – President & CEO, T-Sportline
- ***Steve Whipple*** – President, PRW Industries

New outgoing board members were recognized in July during the 2024 SEMA Leaders & Legends Gala. ***TS***

The industry continues to innovate, creating new solutions to shape the future of the specialty automotive aftermarket.





PERFORMANCE

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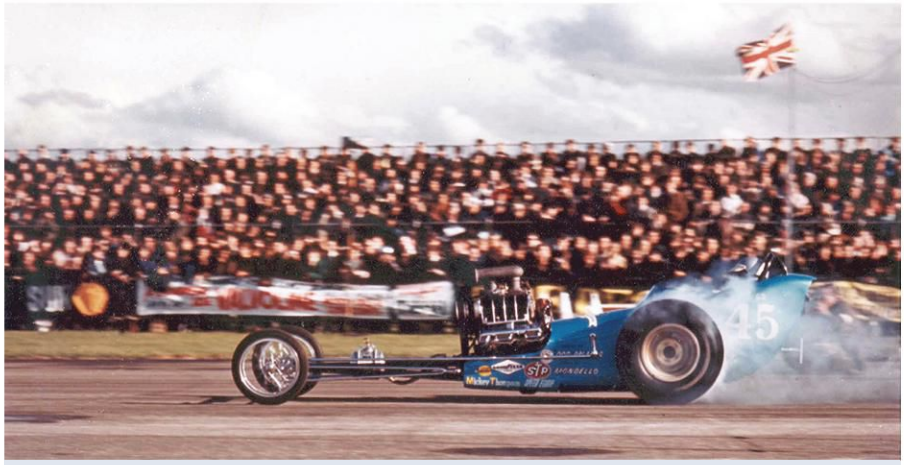
AN AMERICAN INVASION

Sixty years ago, a visit by U.S. dragsters left a permanent mark on England. **By Tony Thacker**

When the unlikely named Dante Duce, owner of Duce's Speed Shop in Las Vegas, read that British sports car builder Sydney Allard was constructing Britain's first dragster, he placed a call to Allard and challenged him to a race.

What Duce didn't have was a dragster, or money. He knew who to call, though, reaching out to one of his suppliers, Dean Moon, who did have a dragster—sort of—and could make the connections to what is now the Specialty Equipment Market Association (SEMA) that could help foot the bill.

In early September 1963, Duce and Moon arrived in England for a short series of match races against Allard's rather agricultural Chrysler Hemi-powered machine that even sported front brakes (the Brits insisted).



Racers Dante Duce and Dean Moon taking a dragster to England for a series of match races in 1963, and then a subsequent visit by the U.S. Drag Team the following year, are credited as the start of an "American invasion" that sparked overseas interest in drag racing that still exists today.

The Mooneyes dragster, meanwhile, was state-of-the-art in 1961 with a Dragmaster chassis and a front-mounted, Potvin-blown small-block Chevy. The bright yellow bolide looks dated now, but 60 years ago it was the bee's knees.

Featured on the cover of the September 1961 issue of HOT ROD magazine, the

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AN AMERICAN INVASION



A Dragstalgia event in England in July proved that the American drag racing influence is still alive and well across the Atlantic.

Mooneyes dragster in the hands of Gary Cagle ran 9.52 seconds/153.06 mph and won Middle Eliminator at the 1963 Winternationals. After its win, Moon sold the car to model maker Revell, which toured it around the U.S. to promote a model kit.

In England, the dragster was a hit. The Brits had never seen anything like it.

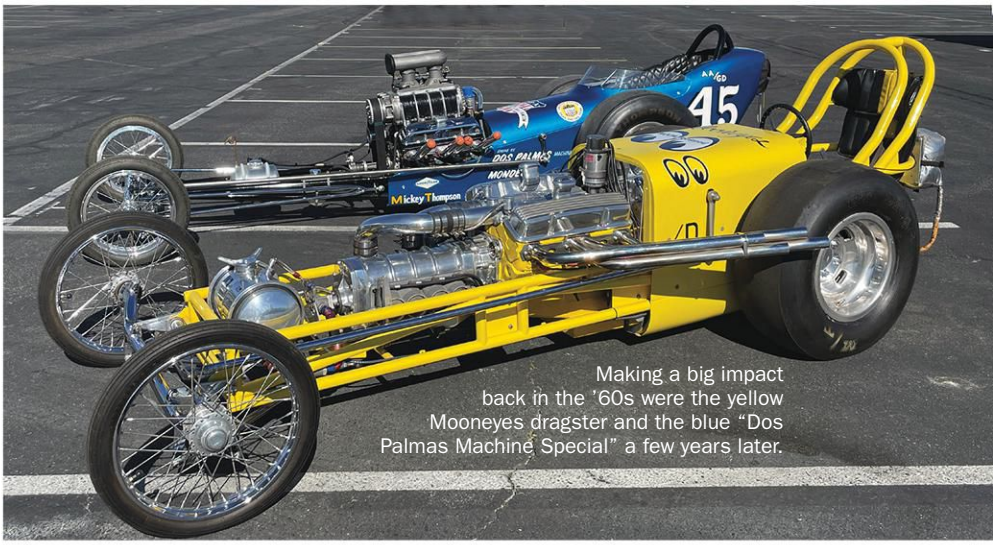
Then, into the nest flew Mickey Thompson.

Not one to be left out, Thompson had flown his "Harvey Aluminum Special" to England and muscled his way into the second event at the Brighton Speed Trials. Blown and running on nitro, Thompson eclipsed Duce's gas dragster and Allard's tractor and stole the show.

In fact, the original match race plan was lost in the tire smoke and flames caused by Thompson's headers setting fire to the hay bales.

OVERSEAS INFLUENCE

A figurative fire had been lit as well. While



Making a big impact back in the '60s were the yellow Mooneyes dragster and the blue "Dos Palmas Machine Special" a few years later.

BECKMAN FINISHES FOR FORCE

Former Funny Car world champion Jack Beckman was named the replacement driver of John Force's Peak Antifreeze and Coolant Chevrolet Camaro SS for the remainder of the 2024 season in what the team called "Joint Task Force – Mission Championship."

In late July, with an NHRA championship still very much in play, Beckman took the wheel while Force continued to recover from a TBI (traumatic brain injury) suffered in a June 23 crash in Richmond.

When Force was injured, he was second in points behind John Force Racing teammate Austin Prock.

By NHRA rules, when a driver is unable to compete, the race team may employ a substitute who can earn points for the original driver in a maximum of eight tour events.

"When you think about someone who can handle the driving, can deal with the media, take care of the sponsors and take care of the fans, there was only one obvious choice, and that was



Jack Beckman was named the replacement driver for John Force after Force's serious drag racing accident in June. (Photo courtesy NHRA)

Jack Beckman," says Robert Hight, John Force Racing president. "Plus, he has history with Chris Cunningham (co-crew chief on the Peak Chevy with Dan Hood and Tim Fabrisi) and has the respect of John's family."

A 33-time event winner in Funny Car, Beckman last raced competitively in 2020 when he returned to being a full-time elevator technician, a career that he left 22 years earlier to follow his drag racing dream.

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AN AMERICAN INVASION



Both race cars are credited with spurring drag racing enthusiasm in the UK and these days are often shown together at shows and events.

the Americans went home, the Brits were hooked and a strong market for American speed equipment was born that continues to this day.

The visiting dragsters had such an impact that the following year, a group of American drag racers took their cars to England. The 1964 U.S. Drag Team included Don Garlits, Tommy Ivo, Tony Nancy, Ronnie Sox and Buddy Martin, Dave Strickler and Bill Jenkins, Doug Church, Dante Duce, KS Pittman, George Montgomery, Bill Woods and Don Hyland.

It was quite the invasion.

The team was led by Bob Keith of San Jose, who had assumed Duce's role and had been communicating with Allard regarding the First British International Drag Festival. Relatively unknown, Keith was driving the Goodnight, Keith and Williamson "Dos Palmas Machine Special."

Built initially by Gary Goodnight and engine builder/driver Arnold Chaves, "Dos Palmas" was a lightweight, pretty little gas dragster years ahead of the Mooneyes Dragmaster. It had a short, 117-inch wheelbase chassis from "TV" Tommy Ivo; a Tony Nancy interior; a beautifully formed "chute pack" body by Jack Hagemann; and a blown, injected 400-ci Chevy by Arnold.

Keith was the first American to make a run on the damp UK soil that year, and out of the box ran an impressive 8.70 seconds/171 mph.

The Brits were so impressed by the sleek "Dos Palmas Machine Special" that it was purchased by the Croft Drag Racing Partnership and it stayed and raced in the UK—as had Thompson's "Harvey Aluminum Special."

The racer who secured "Dos Palmas" was U.S. Air Force man "Wild" Bill Weichelt, who returned to the U.S. in 1971 and raced the car at the '71 U.S. Nationals. Unfortunately, the car was no longer competitive, and Weichelt and the car disappeared until NASACAR/TV personality Ray Evernham found and restored it with Chaves, Goodnight and Keith in time for the 2015 California Hot Rod Reunion.

BACK TO BRITAIN

In 2022, another British consortium consisting of Nick Davies of I.C.E. Automotive, Mick Jenkins of Mick's Paint, Geoff Stilwell, Stewart Bassett of USAutomotive and myself acquired the "Dos Palmas Machine Special" with the intention of preserving it.

Thanks to Scott Campbell, the car is still running strong and is often displayed alongside the Mooneyes dragster, just as if it was the Swingin' '60s all over again.

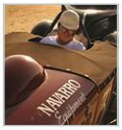
As if that wasn't enough, earlier this year the UK's Santa Pod Raceway announced plans to ship both dragsters back to England to celebrate 60 years of UK drag racing. Joining the dragsters was Seattle's Randy Bradford with his Nostalgia AA/Fuel Altered Fiat.

There are not many Nostalgia Fuel Altereds left running in the U.S. and there's only one in the UK—Davies' "Havoc"—so the two squared off at the annual Dragstalgia event held in July.

"I've raced Randy in the U.S.," says Davies, whose company, I.C.E. Automotive, specializes in building American V-8-based racing engines, before the show, "and he's very competitive, so it's going to be a lot of Fuel Altered fun."

If Duce were alive today, I doubt he'd believe what an impact that trip to see Allard had all those years ago. Without that call and the subsequent enthusiasm of Americans to take their unique sport of drag racing to the UK, there might not be any European drag racing or even an American car scene.

"It's impossible to calculate the impact those '60s American imports had," says Bassett, owner of USAutomotive. "Without those racers, there would be a very different scene (in England) and we wouldn't be importing U.S. speed equipment and spares." ***TS***



Born in England, ***TONY THACKER*** *is an accredited automotive journalist, author and book publisher, and served as marketing director at the famed SO-CAL Speed Shop.*

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Need help choosing the proper products and setup? Experienced suppliers are happy to share their suggestions. (Photo courtesy East Coast Gear Supply)

WORKING IN UNISON

Today's drivetrain products help move projects forward.

By John Carollo

Drivetrain creation is among the few performance projects that allow professionals to use their creativity and individual expression. From the backend of the engine all the way to the tires, there are many choices to be made and opportunities to maximize.

It's been said many times, but crazy engine horsepower numbers don't mean much if the driver can't get that power to the ground. Thankfully, from flywheels, shifters and transmissions to driveshafts, axles and gears, today's drivetrain products are more than up to the challenge.

Suppliers are here to help assemble the puzzle pieces, offering thoughts on market changes, best practices and the latest can't-miss products. Get everything fitting together nicely and your customers will soon realize the benefits of a complete drivetrain system working in unison.

GEARS KEEP TURNING

Like seemingly every other part of the performance market, drivetrain products continue to get stronger, more efficient and more technologically advanced.

"Over the last decade there have been many changes in the performance drivetrain market," observes Chris Troxel, brand manager at Competition Clutch. "Some of these changes include technology such as different friction compounds as well as other new materials that are found in the drivetrain. These changes have allowed us to use better disc materials that will hold way more power as well as include stock-like drivability."

Customer tastes and trends are always evolving as well, notes Matt Graves, marketing manager at American Powertrain, with many gravitating toward preselected components proven to work in tandem.

"People want complete turnkey packages," he says. "With crate engines being more popular as well, we want to be a one-stop shop for customers and help them take the guesswork out of what components they need. More people are turning back to manual transmissions than ever these days."

One constant, however, is the continuing popularity of manual transmissions, says Trent McGee, marketing manager for Centerforce Clutches.

"Even though there are fewer manual-equipped vehicles being produced every year, we're seeing much more movement on our higher-end, higher holding capacity clutches than we did with our milder performance clutches a decade or so ago," he says. "People are focusing on higher-end builds, whether it's a dedicated track car or a street vehicle with some serious power, as opposed to a mildly modified build. And with the power potential of modern engines, serious performance engines are easier to build than ever before. This in turn demands some pretty serious clutches and

drivetrains to handle that power."

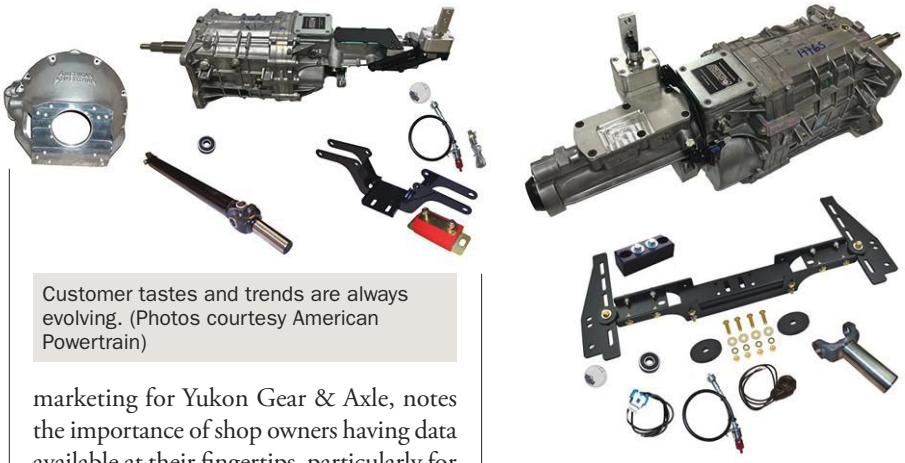
The end use of the vehicle being upgraded always plays into those changes and choices, says Chase Perry, president of East Coast Gear Supply.

"There has been increased demand for late-model vehicle drivetrains for extreme conditions," he reveals. "We're seeing high horsepower and big tires on newer vehicles that want to rock crawl, overland, desert race and commute daily. Singular, multiuse vehicles have become the norm, requiring a product that can handle mileage and shock load."

Overall, more market information is being shared, leading to more successful projects, says Greg Milentis, business unit manager, aftermarket differentials, for Auburn Gear.

"Our shop partners have shared that gaining access to detailed specification data has improved over time, which is essential to more well-informed decisions when making recommendations on performance parts for their consumers," he says.

Neal Hollingsworth, vice president of marketing for Yukon Gear & Axle, notes the importance of shop owners having data available at their fingertips, particularly for vehicles over the past 10 years.



Customer tastes and trends are always evolving. (Photos courtesy American Powertrain)

"Keeping up with electronics and new model changes has gone from catalog racks to downloads and web access. Companies like DCI, SDS and ASAP all have access parameters and provide amazing data sets to dealer networks—some at little or no charge to dealers," he says. "This is a traditional industry in most cases, although new product technology is making parts better and getting them to market faster. It can be tough keeping up with it all at the dealer level, so shops will want to find trusted industry experts and keep them close."

THE LATEST INFO

With so many products and so many options, it's not a surprise that some misinformation has bubbled up surrounding proper drivetrain configurations.

"One common misconception faced by shops and end users is that bigger is always better," says Troxel. "For example, it would not be necessary to install a multidisc clutch kit in a vehicle making 250 hp and doing road course track days. By choosing the correct clutch for a vehicle you will maximize performance, life span and drivability."

McGee notes that drivers can get the



WORKING IN UNISON

DRIVETRAIN PRODUCTS

■ **HOT PRODUCTS:** American Powertrain TREMEC TKX 5-Speed Turnkey Kits
■ **FEATURES & BENEFITS:** No cutting the car for installation; take the guesswork out of installation and fitment.

American Powertrain
Matt Graves
Marketing Manager

■ **HOT PRODUCT:** Grip-N-Loc Limited-Slip Differential
■ **FEATURES & BENEFITS:** Well known in the aftermarket for its American-made legacy and strong reputation; recognized for its performance both on the street and at the track; used in performance axles including the GM 8.5- and 8.6-inch 10-bolt; enhances traction and stability.

Auburn Gear
Greg Milentis
Business Unit Manager, Aftermarket Differentials

■ **HOT PRODUCT:** Solid Street Twin (SST)
■ **FEATURES & BENEFITS:** Entry-level twin-disc clutch; impressive holding capacity; attractive price point; borrows heavily from the technology that goes into our high-end DYAD line of twin-disc clutches, including a unique anti-rattle floater system.

Centerforce Clutches
Trent McGee
Marketing Manager

■ **HOT PRODUCTS:** Honda 184mm Twin- & Triple-Disc Clutch Kits
■ **FEATURES & BENEFITS:** Available for the Honda B, H and K series; industry-exclusive throw-out bearing; two 245mm twin-disc kits for the Nissan 400Z are also available with an aluminum flywheel for improved drivability and faster turbo spooling.

Competition Clutch
Chris Troxel
Brand Manager

■ **HOT PRODUCTS:** D60 & Larger Complete Axles
■ **FEATURES & BENEFITS:** Bolt-in ready; capable of handling extensive aftermarket upgrades.

East Coast Gear Supply
Chase Perry
President



Today's drivetrain products are well equipped to move projects forward. (Photo courtesy Yukon Gear & Axle)

Having data at their fingertips can help shops select the right product for each application. (Photo courtesy Carli Suspension)

performance and drivability they want.

"Even though it's not really true anymore, there's a lingering perception out there still that performance clutches mean a very stiff pedal. That's not the case. We do a variety of things to our clutch assemblies to increase holding capacity without sacrificing pedal effort, such as a patented centrifugal weight system."

He adds that some believe a performance clutch automatically means very aggressive engagement.

"While it's true that you are going to sacrifice some drivability for performance, we've been able to develop products like our SST that offer some pretty serious holding capacity numbers and are perfectly livable on the street. They're certainly more aggressive than a stock clutch, but nothing like the on/off switch feel of a dedicated racing clutch."

Perry says that many customers come to a shop knowing what they want. It's up to the professional to determine whether those desires make sense for the project at hand, however, and gently steer them toward a better solution, if needed.

Milentis offers an example.

"Tandem Automotive owner Alex Moreno shared that consumers select air lockers based on their 'ease of use,' but,

Auburn Gear's GM 8.5- and 8.6-inch axle-related Grip-N-Loc limited-slip performance differential. (Photo courtesy Auburn Gear)





Performance projects don't mean much if that power can't be properly transferred to the ground. (Photo courtesy Dynatrac)

in reality, installation requires more labor charges, and he finds that the air lines are sensitive and more prone to damage," Milentis reports. "Alex prefers working with the Auburn Gear electronic lockers and mechanical limited-slip differentials due to their ease of installation and long-term durability."

Meanwhile, while some are well-informed, others may come in not understanding the variety of options available.

"Customers don't know that they can get



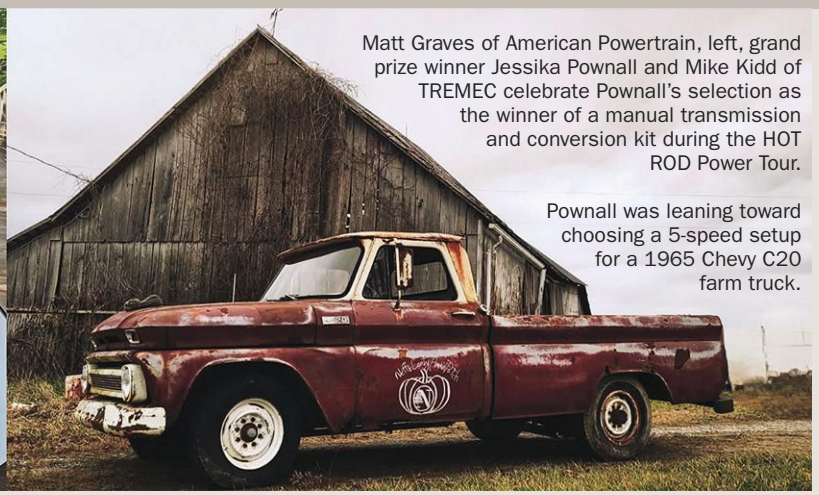
Shops can educate customers on the benefits of upgrading drivetrain components such as a clutch and/or flywheel. (Photo courtesy Competition Clutch)



WORKING IN UNISON

LONG-HAULER WINS TRANSMISSION PACKAGE





Matt Graves of American Powertrain, left, grand prize winner Jessika Pownall and Mike Kidd of TREMEC celebrate Pownall's selection as the winner of a manual transmission and conversion kit during the HOT ROD Power Tour.

Pownall was leaning toward choosing a 5-speed setup for a 1965 Chevy C20 farm truck.

HOT ROD Power Tour long-hauler Jessika Pownall won a manual transmission and conversion kit, courtesy of TREMEC manual transmissions and its leading national distributor, American Powertrain.

The contest was open to the 10,000-plus registered Power Tour Long Hauler participants during the five-day road tour event that began June 10 in Bowling Green, Kentucky, and concluded June 14 at Lucas Oil Indianapolis Raceway Park.

"We've participated with TREMEC in almost every Power Tour since its start. There's a lot of excitement on the last day of the event when long-haulers can win big prizes like ours," says Matt Graves, American Powertrain marketing and product manager. "For this grand prize, all they had to do was stop by our booth during the tour and get two tickets to enter—one from American Powertrain and one from TREMEC. We couldn't make it easier. It's also a great way to connect with our core customers and answer any questions they may have."

The grand prize is valued at over $5,000 and includes a choice of a 5- or 6-speed TREMEC and complete American Powertrain installation kit.

Upon being selected the winner, Pownall said she was "leaning toward a TR-4050 5-speed to use in our 1965 Chevy C20. We farm pumpkins and this truck has been the face of our farming operation for marketing. The 5-speed would be good for towing and this truck needs a new transmission. We're excited to give it an upgrade."

Also present at the 30th anniversary Power Tour was last year's winner, Trace Boyd.

"Every year, the number of TREMEC manual transmission-equipped cars and trucks on the tour continues to grow," says Mike Kidd, TREMEC's aftermarket business manager. "That's why we're here. The HOT ROD Power Tour is a great way to meet our customers and to answer questions people may have about upgrading to a manual 5- or 6-speed."



Many drivers are focusing on higher-end builds, whether it's a dedicated track car or a street vehicle with serious power. (Photo courtesy Centerforce Clutches)

PLANNED PARTNERSHIPS

To make the most of performance drivetrain projects, shops can partner with customers on expected vehicle use.

"Don't ask what the customer wants—ask what their expectation is. Then make the solution available to meet that expectation," advises Perry from East Coast Gear Supply. "For example, a customer may want 40-inch tires and lockers on their D30/D35, but their expectation is that with lockers and 40s they can go anywhere. Build out a package that can achieve the expectation."

Once they've made a decision, customers a more complete install package from companies like American Powertrain," Graves explains. "Some places still try to piece together parts from junkyards or mismatch parts to make it work. It just creates more headaches for them and their customers."



From the backend of the engine all the way to the tires, there are many choices to be made and opportunities to maximize. (Photo courtesy Zumbrota Drivetrain)





Drivetrain creation is among the few performance projects that allow professionals to use their creativity and individual expression. (Photos courtesy ICON Vehicle Dynamics)

are anxious to get going, notes Troxel from Competition Clutch.

"Have inventory on hand," he recommends. "Shops should also be sure to educate their customers on the benefits of upgrading components of the drivetrain such as a clutch and/or flywheel, as well as the importance of drivetrain maintenance."

McGee from Centerforce, who also suggests carrying a robust inventory of popular models for quick turnarounds, believes the most successful shops shoot straight with their clients.

"Understand your customer's needs and expectations and be careful not to oversell them. As mentioned earlier, you do sacrifice drivability for performance and some clutch types are more aggressive than others. Understanding the differences between those clutch types and how they impact performance and drivability will go a long way toward being able to provide the best choices that meet your customer's needs."

And don't forget that suppliers are always happy to work to make things easier.

"If you don't have the data you need to help your customer make the best decision for their performance differential-related needs, just ask," says Milentis from Auburn Gear. "That's what we're here for."

Yukon's Hollingsworth notes that even with constant market evolutions, sometimes the tried-and-true approach is most effective.

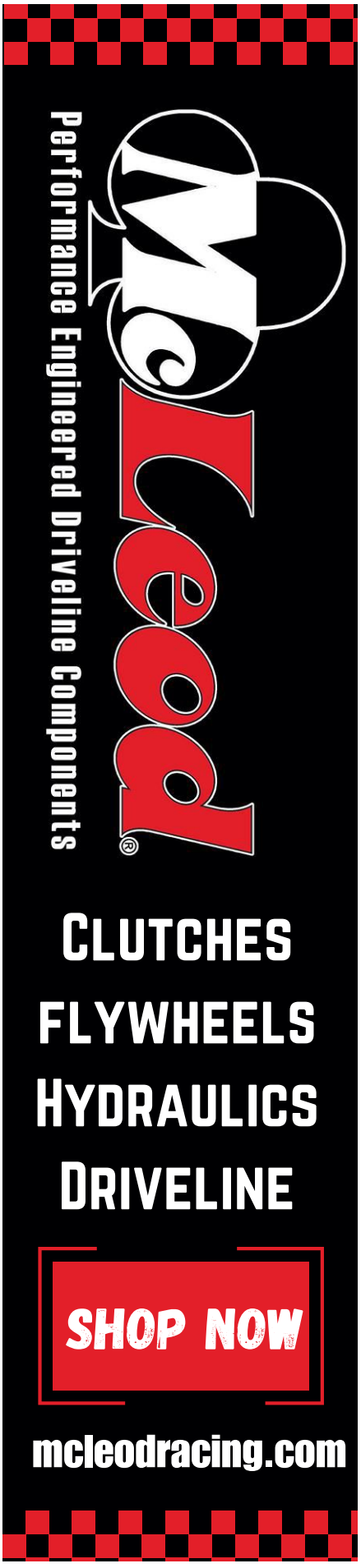
"Maybe the most important way to serve your customer is the old-school, 'pick up the phone and call your sales contact at the manufacturer' approach. These people are taking calls all day long—from tech to warranty to parts sales—for all types of vehicles and all types of years. They know the single part to the system that makes the most sense," he says. "These tech advisors are most likely enthusiasts with a massive amount of industry experience, so they understand the broad opportunities of system upgrades and know what works together to create the best outcome for the shop customer."



When drivetrain systems are properly matched, projects are more successful. (Photo courtesy Cognito Motorsports)

With so much to sell, and so many decisions to make, there's a lot for installers to study.

"Learn the product line you are selling," says Graves from American Powertrain. "At the end of the day, that's how you convince customers to spend money with you and trust your shop." ***TS***



PERFORMANCE **PRODUCTS**

Stock Your Shelves With These Go-Fast Components



Honda Civic Type R Cat-Back Exhaust

BORLA Performance Industries, Johnson City, Tennessee, presents its Cat-Back Exhaust System for 2023-24 Honda Civic Type R models that improves horsepower and torque. System 140927CFBA features an active exhaust valve and delivers the aggressive ATAK sound without any drone or resonance inside the vehicle. The system is made from T-304 stainless steel with carbon fiber tips. It features all-welded construction for durability and long life.



EPA-Compliant Catalytic Converters

Street Series, Benicia, California, presents its R-CAT Series 4 Federal EPA-Compliant Catalytic Converters. Made in the USA, R-CAT catalytic converters meet or exceed EPA standards and are designed to optimize exhaust gas treatment, effectively reducing harmful pollutants while enhancing engine efficiency. Available for a wide range of vehicle makes and models, the Series 4 converters feature a 5.0-inch spun body and include a single ceramic substrate that features a 600-cell count with a precision-placed rear O2 sensor port for optimal efficiency.

Mopar Coil-Overs & Air Suspension

Ridetech, Jasper, Indiana, presents Adjustable Coil-Over and Air Suspension Systems, now available for Dodge Charger, Challenger, Magnum and Chrysler 300C applications. The systems provide an aggressive-yet-functional muscle car stance, featuring a rubber isolated spherical bearing design that minimizes NVH noises commonly associated with performance-oriented suspension systems. The systems include black-and-gray anodized finishes.





Ceramic Silver Brake Pads

Hella Pagid, Peachtree City, Georgia, presents Ceramic Silver Brake Pads. Engineered to meet and surpass OE quality standards, the pads undergo extensive testing for improved stopping power. Specifically designed for North American driving conditions and compatible with U.S. domestic and Asian vehicles, the pads are composed of materials with no steel content and are free of asbestos and copper, ensuring environmental safety and compliance.



Explorer ST Exhaust

AWE, Horsham, Pennsylvania, presents its new Touring Edition Cat-Back Exhaust Suite for Ford Explorer ST models. The system features patented drone-canceling 180 Technology; a 50-state-legal, emissions-friendly, dual 3-inch cat-back configuration; and slip-fit inlet adapters for factory downpipe fitment while leaving an open 3-inch connection for aftermarket complements upstream. A precision X-pipe unlocks a clean, exotic EcoBoost exhaust note while keeping rasp in check.

Nissan Patrol Clutch Kits

Advanced Clutch Technology (ACT), Lancaster, California, presents Clutch Kits for Nissan Patrol Y61 series models equipped with the powerful TB48 engine spanning from 2001-24. The precision-crafted clutch systems are designed to withstand regular street use and off-road conditions. A wide range of street-friendly (Organic Street Disc) to race-ready (6-Puck Cerametallic Disc) kits offer torque capacities ranging from 986 to 1,543 pound-feet. They incorporate two discs for twice the disc surface area of conventional clutch designs.





Mopar Aluminum Brake Kits

LEED Brakes, Cheektowaga, New York, presents its MAXGRIP LITE 4 Piston Aluminum Disc Brake Kits, designed specifically for Mopar A, B & E, and C body cars. Available in spindle mount, complete manual, manual-to-power and power-to-power configurations, the direct bolt-on kits are engineered to seamlessly mount to factory drum brake spindles and fit most factory Mopar 14-inch wheels. Each kit includes all necessary components for mounting the MAXGRIP Lite 4 Piston Disc Brakes onto the vehicle's existing drum brake spindles.

F-Series Updated Instrumentation



Classic Dash, Carson City, Nevada, presents Upgraded Instrumentation for 1973-79 Ford F-Series trucks. Designed to easily replace the boxy factory gauges with contemporary digital and analog panels, the products are made from rugged UV-resistant composite material and easily bolt-in using common tools. On the digital side, a 12.3-inch matte black **Holley** EFI panel has a multitude of preprogrammed displays or can be customized.



Floor Mounts

Flaming River, Berea, Ohio, presents its all-new Black Satin Series Floor Mounts. The precision-crafted mounts bring a clean look to the interior and are engineered to fit a wide range of vehicles. They include a sleek, black powder-coated finish that adds a touch of class and ensures superior durability. Corrosion-resistant, they are made in the USA. *TS*



INTERVIEW: ESTEVAN CABALLERO

Learn a little about the automotive content creator & expert gearhead.



Estevan Caballero with Jonny Grunwald's Mazda RX7 at the 2022 SEMA Show. (Photo courtesy Pennzoil)

Estevan Caballero, automotive content creator and expert gearhead, knew from a young age that he was destined for the automotive industry.

Growing up playing Gran Turismo with his dad and uncle, Caballero's love for cars began when he raced in the virtual Pennzoil livery. This passion, further fueled by "The Fast and the Furious" movies and a fascination with JDM cars such as Skylines and Supras, set him on a path toward a dynamic career in the automotive industry.

Pennzoil stopped by Caballero's garage to chat about his journey to becoming one of the top content creators for car enthusiasts.

Q WHEN DID YOU START YOUR JOURNEY IN THE AUTOMOTIVE INDUSTRY?

ESTEVAN CABALLERO: When I finished college, I secured a job at BMW. While working there, I bought my first car, a BMW 135i, and from there, I became obsessed.

In 2020, when everything was paused, I launched my personal "brand" on TikTok and quickly created my very first viral video, which was about my cars. I started from there and have been a creator ever since.

Q GROWING UP, WERE THERE MOMENTS WHEN A FAMILY MEMBER BROUGHT YOU INTO A GARAGE AND TAUGHT YOU THE ESSENTIALS, OR WERE YOU MORE SELF-TAUGHT WITH YOUTUBE?

EC: My grandpa was a wizard with cars, bringing me into his garage from a young age. He could open a car's hood and, without touching it, tell you what was wrong and how to fix it.

My uncle also had an El Camino that they worked on together, teaching me as they went.

Q DID ANYONE HAVE A SIGNIFICANT ROLE IN SHOWING YOU HOW TO BECOME A CONTENT CREATOR, OR DID YOU LEARN AS YOU WENT?

EC: In the beginning, it was mostly me trying to figure things out on my own. I believe that I was one of the first car creators, along with a handful of other amazing people, who paved the way for "Car TikTok." At the start, we just bounced ideas off each other.

Later, Jonny Grunwald took me under his wing and showed me how to level up my content and make connections in the automotive industry. Learning from someone who has been around for so long and is so successful has been a privilege.

Q WHAT IS A TYPICAL DAY IN YOUR LIFE?

EC: The fun part about this job is that every day is different. Typically, I head to Stryker Performance, where my car is being built up to about 1,000 hp. It's very exciting and nearly done.

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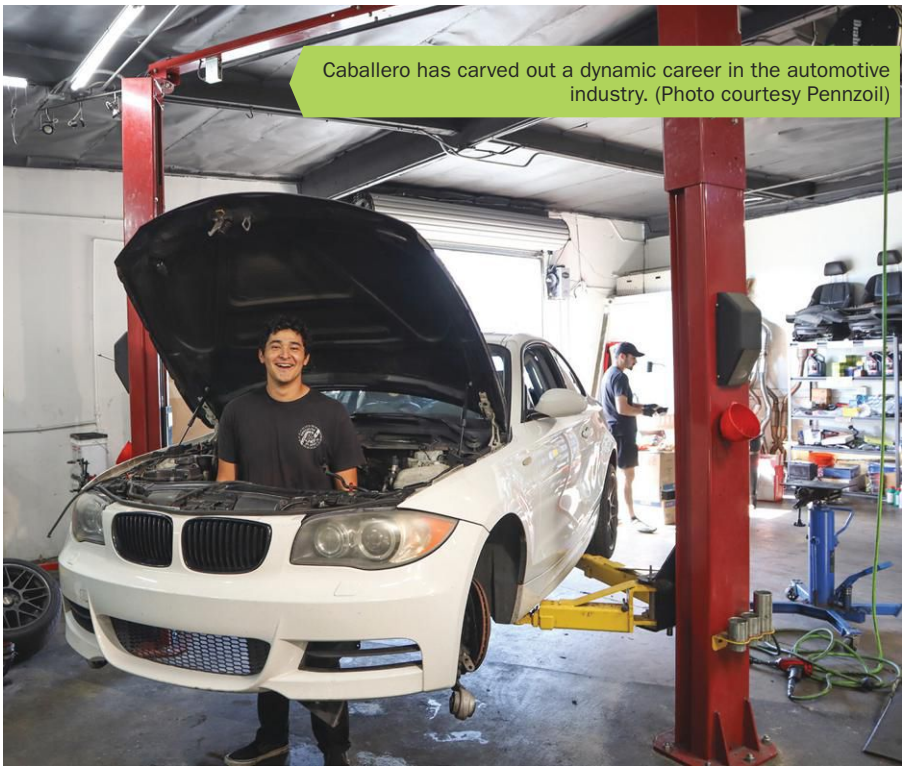
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Caballero has carved out a dynamic career in the automotive industry. (Photo courtesy Pennzoil)



Caballero with the Yellow Submarine at SEMA 2022. (Photo courtesy Pennzoil)

If I'm not there, I'm working with TunerCult, a company that does giveaways for automotive enthusiasts. I manage their social media and handle the giveaways.

Otherwise, I'm brainstorming and filming content for my channels.

Q BESIDES JONNY, IS THERE ANYONE ELSE YOU'VE LOOKED UP TO IN THE INDUSTRY?



EC: Ken Block. His cars just spoke to me and always ignited my passion to keep going, build more and continue to build a community of other enthusiasts.

I think people can tell, but I take inspiration in my builds from Ken.

Q WHAT ARE THE PROJECTS YOU'RE CURRENTLY WORKING ON?

EC: Right now, I have a 2009 BMW 135i, which has been my main project with Stryker Performance. I also have a 2008 Mazda Miata that we're planning to do an LS swap on, which is exciting.

Additionally, I have another project that should be starting soon.

Q WHAT ARE THE ESSENTIALS YOU THINK EVERY CAR ENTHUSIAST SHOULD HAVE IN THEIR GARAGE?

EC: For me, it's essential to have plenty of shop rags, because they always get dirty, a good supply of 10mm wrenches and, of course, Pennzoil Full Synthetic motor oil.

Q OUT OF ALL THE CARS YOU HAVE SEEN, DRIVEN OR WORKED ON, DO YOU HAVE A FAVORITE?

EC: I have too many favorite cars to choose from. But one of them is the Ferrari 488 Pista. It's powerful and incredibly fun to drive.



His advice for future content creators is to show your passion and be consistent. (Photo courtesy Pennzoil)

Q AS YOU KNOW, PENNZOIL CELEBRATES ALL TYPES OF DRIVERS WITH ITS CAMPAIGN, LONG MAY WE DRIVE. WHAT DOES "LONG MAY WE DRIVE" MEAN TO YOU?

EC: To me, *Long May We Drive* is about the passion found behind the wheel and under the hood. Whether racing, taking road trips or building or maintaining my cars in the garage, it is a way of life.

Q IS THERE ANY ADVICE YOU WOULD GIVE SOMEONE LOOKING TO PURSUE CONTENT CREATION IN THE AUTOMOTIVE FIELD?

EC: When it comes to content creation, the first thing you need to do is start. If you have a phone with a camera, you can get going. Be consistent and passionate about what you talk about and you'll see progress.

The best way to get involved is by attending events near you. Whether it's motorsports, car shows or other automotive events, it's a great way to learn and create content.

The car community is very supportive and passionate—if you are authentic, you will be welcomed with open arms. ***TS***





Engine Roundup p. 40 / Engine Products p. 42

Building a Big-Block Chevy, Part VI

Final steps & a turn on the dyno.

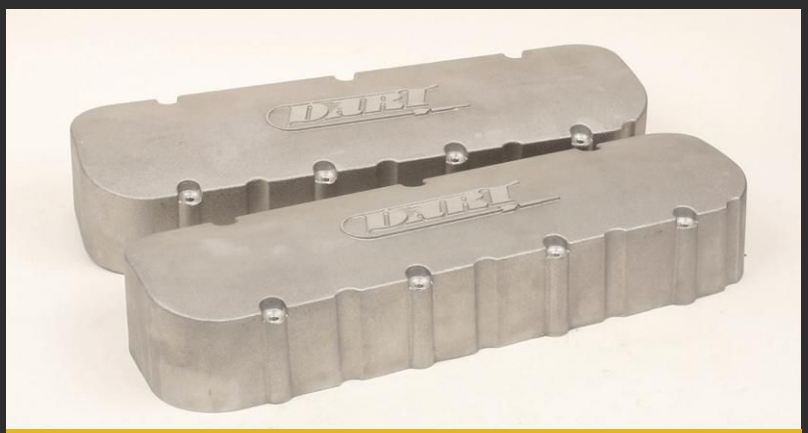
Build, text & photos by Mike Mavrigian

EDITOR'S NOTE: *This is the sixth and final installment in a series highlighting the steps to building an old-school Chevrolet big-block performance engine. Part I appeared in the July 2023 issue of THE SHOP magazine, Part II appeared in the October 2023 issue, Part III in the January 2024 issue, Part IV in the April 2024 issue and Part V in the July 2024 issue.*

VALVE COVERS

The Dart inverted-flange cast aluminum valve covers P/N 68000040 included 14 hex head bolts (seven per cover), size 1/4-20x3.500 inches. However, these proved a bit too long to allow full clamping of the valve covers with gaskets in place. For the valve cover bolt locations that did not require our spark plug wire holders (inboard three and outboard front), I used 1/4-20x3.250-inch socket head stainless screws, while the location that we chose for the wire holders required 1/4-20x4-inch screws. In order to provide a bit of friction reduction between the screw underhead area and the paint, I included stainless quarter-inch flat washers at each screw location.

Since we opted not to use a vacuum pump system, in order to provide crankcase breathing I opted for a pair of Moroso 68800 weld-in breather tubes and filters on the left bank cover (close to the top, centered about 3.750 inches rearward of the front cover wall and the same distance from the rear wall, avoiding locations where rocker oil might directly toss oil into the tubes).



As shipped, the Dart inverted flange valve covers offer ample clearance for the stud girdles and provide a stable platform for maintaining gasket seal.

Since this engine will likely experience street use, I added an aluminum 90-degree PCV valve from Summit Racing. This was installed to the rear roof area of the right bank cover, requiring a 1.22-inch hole to accommodate the grommet.

Fitting the 1.377-inch-diameter breather tubes required drilling holes using a step bit to about 1.375 inches. I then carefully finished the hole with a die grinder and aluminum cutting bit, slightly enlarging the hole L-R width to 1.378 inches and the top-to-bottom to 1.400 inches, creating a slightly elliptical hole that allowed me to cant the angle of each tube biased slightly toward true vertical once the cover was installed, simply for the sake of appearance.

The tubes were then TIG welded at Saeco Fabricating in nearby Wadsworth, Ohio, from the inside of the valve covers.



The covers were painted black and plates with the AERA logo were added later.

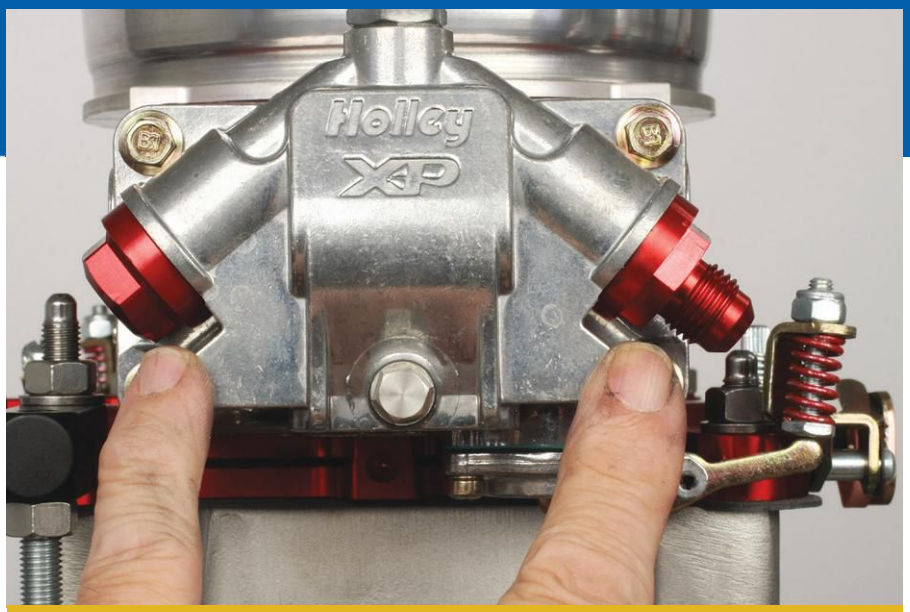
Both covers were treated to a light coating of SEM etching primer, followed by several coats of Dupli-Color DE1634 satin black ceramic engine paint (breather tubes in same



The AERA logos were applied to the upper forward area of each valve cover.

color). Once paint was cured, the raised Dart logos were carefully detail-sanded bare by Larry Ritz, my shop's fabricator/detail wiz, to provide logo contrast, finalized with 1,200-grit paper followed by polishing with fine-grade (gray) Scotch-Brite.

I had initially planned to paint the valve covers in Chevy orange to match the block and oil pan, but since this engine was built for AERA, I needed to incorporate its logo. After mocking up the AERA logos, I decided to go black on the valve covers. I felt that the black logo plates on orange covers might offer a bit too much contrast with an "added-on" appearance.



The Holley Ultra carbs feature ambidextrous feeds at each bowl.

Besides, given the cast surface texture of the valve covers, satin black tends to do a better job of hiding the texture, whereas the orange drew the eye to it a bit too much. Yes, I could have tried sanding/polishing the surfaces, but that would have taken way too much time, and I didn't want to accidentally disturb the Dart logos. Sometimes you just have to go with your gut and make a decision.

In order to add the AERA logos, I started with 6061 T6 aluminum plates





The PCV valve was installed to the rear of the righthand valve cover and plumbed to a vacuum port nipple fitting in the rear carb's spacer.

(2x5.5x0.090-inches) and gently chamfered the edges. The plates are mirror-polished on one side. I shipped the plates to Met-Fin Anodizing in North Wales, Pennsylvania, for black anodizing.

The anodizing, which is an oxidation process, transforms the polished surfaces to a satin finish. Once the anodizing was done, I shipped the plates to Fusion of Ideas in California for full-color laser printing. I've used both Met-Fin and Fusion of Ideas in the past, with both firms providing quality work in a timely manner.

The plates were then secured to the valve covers with a two-part epoxy adhesive. Given the overall design of the engine, the valve covers provided the only practical location for the logos.

The Dart inverted flange covers provided plenty of extra room both in terms of height and inboard/outboard clearance for the use of stud girdles, radical lift, etc. The inverted lip design also provided extreme rigidity to prevent warpage and maintain proper gasket seal (not much chance of warping these covers due to their design).

The right-side valve cover was fitted with a PCV valve that we plumbed to a 3/8-inch nipple fitting at the rear carb spacer plate, using a custom-bent 3/8-inch aluminum tube, connecting both ends with 1.70-inch-long 3/8-inch hose sections.

SPARK PLUG WIRES

Using the MSD plug wire kit P/N 31199 and Made-For-You wire holders P/N 5095611, the plug wires were routed along the outside valve cover bolt locations. The camshaft's 4/7 swap firing order was followed (1-8-7-3-6-5-4-2). Autolite AR3924 spark plugs



The MSD plug wires run along the outboard side of the valve covers, using plastic wire holders that share three of the valve cover bolts.

were gapped at 0.042-inch and installed with anti-seize at 10 pound-feet.

In order to secure the spark plug wire holders to the valve cover bolt locations, 1/4-20x4-inch socket head cap screws were used (the longer length needed due to the thickness of the wire holder bases).

For the sake of appearance, I routed the plug wires along the outboard side of the valve covers using Made-For-You plastic wire holders. Nothing high-tech, but they work well and look good.

Be aware that the halves are secured with 6-32 pan head machine screws that thread into 6-32 nuts. The nuts are placed into hex-shaped pockets on the underside of the plastic holders but are not anchored (they like to fall out and hit the floor and disappear) so beware.

Make sure you hold each nut with one finger while inserting the screw to prevent the nut from popping out (a tiny dab of RTV in the hex pockets before installing the nuts is not a bad idea to help avoid losing nuts during future service).

ENGINE OIL

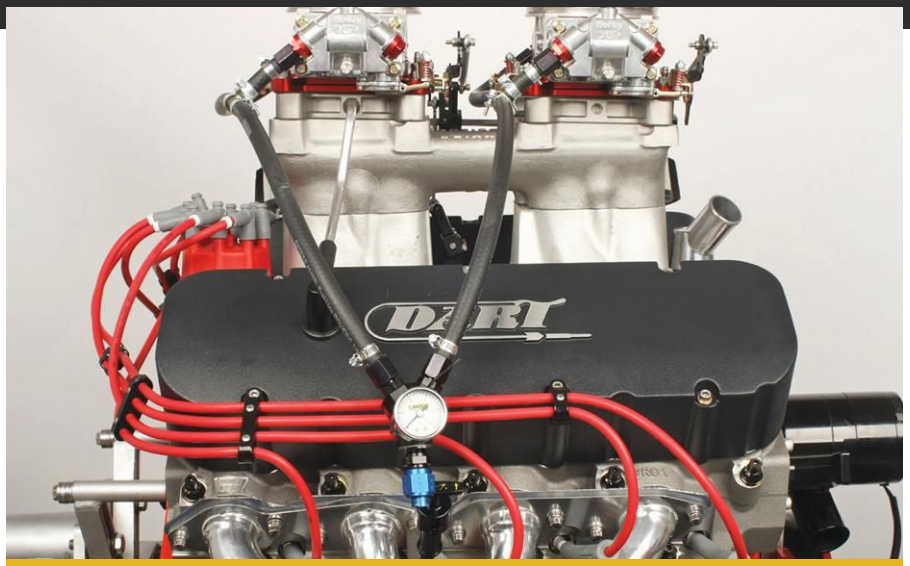
Our oil of choice for the dyno run was



High-zinc Maxima 15W-50 Break-In oil was used for the dyno session. After dyno, Maxima High Performance 10W-40 was added.



The engine was displayed in AERA's booth at the PRI Show in Indianapolis.



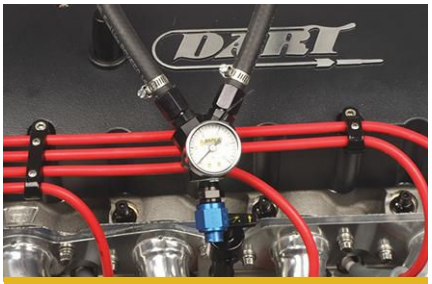
The Y-block bottom will be fed with a -8 AN fitting on the dyno. Nothing fancy, but functional for the test runs.

Maxima 15W-50 Break-In oil, which features a high ZDDP formulation with a shear-stable polymer system to provide fast and effective ring seal.

Naturally, the break-in oil and first Moroso oil filter were changed out after initial break-in. The first filter was cut apart and pleats examined for particles. Gladly, no surprises.

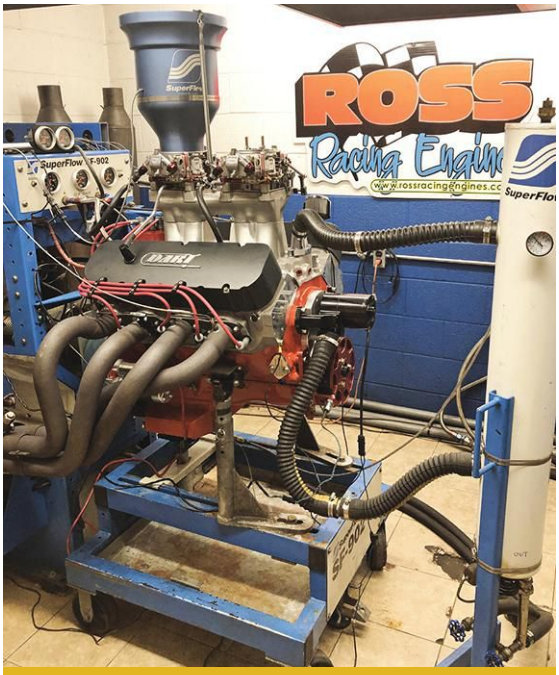
Final oil was Maxima High Performance 10W-40, which is a mineral-based formula utilizing a 2X zinc system and proprietary additive system to ensure protection at any temperature.

Prior to the dyno session, we added 6.5 quarts of Maxima Break-In oil to the sump and filled the Moroso oil filter. Once the display headers were mounted, the Moroso

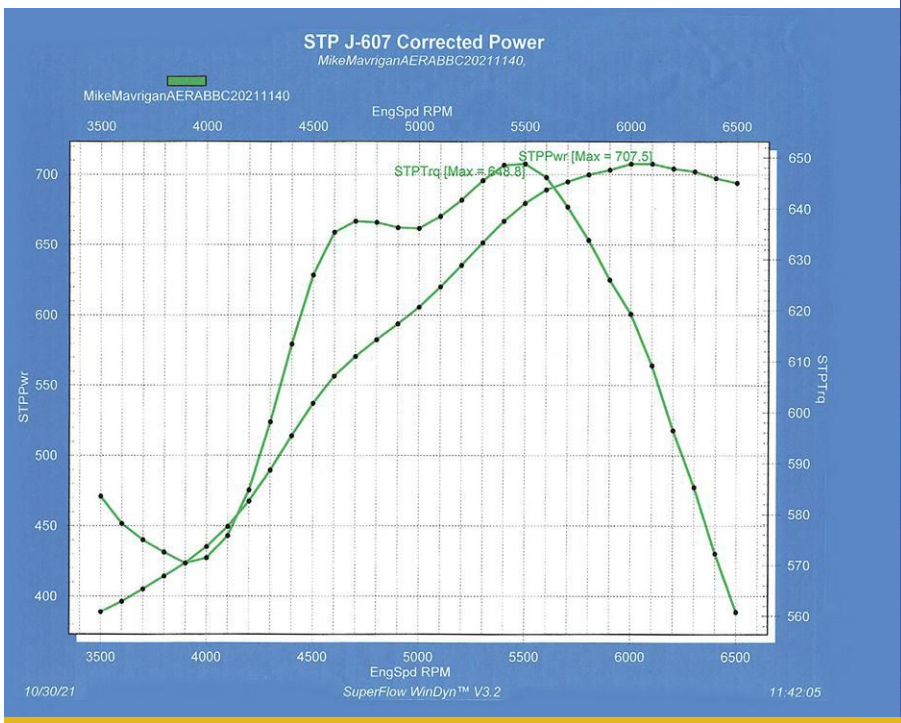


The Earl's Y-block features two -6 AN male outlets and a -8 AN male inlet.





The engine was dyno-tested at Ross Racing Engines on its SuperFlow dyno cell. The results: 653.8 pound-feet of torque at 5,500 rpm and 712.8 hp at 6,100 rpm.



An example of our torque and horsepower curves.

universal dipstick assembly was installed and the fill mark (for the 6.5-quart sump capacity) was noted on the dipstick. The universal dipstick assembly features a compression fitting that threads onto the brass male-to-male fitting threaded into the oil pan (right side).

After checking the oil level, I marked and notched a fill mark 3-7/8 inches from the tip of the stick. Obviously, the fill mark will be dependent on how far you insert the tube into the sump. I inserted the tube until it touched the sump floor, then raised the tube about 3/4-inch and set the tube height by tightening the compression fitting.

A stainless support brace bracket (supplied with the dipstick kit) secured the tube at one of the header flange bolts. The end of the bracket that wraps around the tube snugged up with a socket head cap screw and lock nut, requiring a 3/8-inch open-end wrench to hold the nut and a 1/8-inch hex bit to tighten the screw.

In this installation, there was no need to bend the dipstick tube. It clears the header's adjacent primary tube easily.

BELLHOUSING DOWELS

Excess engine block paint was cleaned out of the block's dowel pin holes. A pair of Dart chamfered-end bellhousing dowels (0.620-inch diameter) were lightly coated with Royal Purple Max Tuff lube and installed to the block rear using a brass hammer, leaving 0.875-inch of exposed dowel. The interference fit was about 0.007-inch.

HEADERS

While we obviously needed to use the dyno shop's headers for the break-in and test runs, I installed a set of Flowtech 31030FLT block hugger tubular headers (a division of Holley) for studio photos and display.

These headers feature 1.75-inch-diameter primary pipes and 2.5-inch collectors and full ceramic metallic coating. The fit to the Dart heads was perfect. The flange is milled flat and is nice and straight, and all bolt holes aligned to the heads.

The header flanges were secured using Fel-Pro exhaust gaskets and an ARP 12-point 3/8-inch stainless exhaust flange bolt kit. Meanwhile, the ceramic metallic coating looks way-cool and appears to have been applied with true attention to detail. This was my first experience with Flowtech headers, and I'm very impressed with the construction, fit and finish.

DYNO RUN

The dyno session was performed at Ross Racing Engines' SuperFlow dyno cell, located in Niles, Ohio, an hour east of my Birchwood Automotive shop.

After shop owner Tony Lombardi fiddled with the timing and made a few carb adjustments on our dual Holley Ultra carbs, the Dart block-based 540 rat motor popped to life with an initial 68-70 psi of oil pressure and warmed up to operating temperature with no issues (no leaks and no funny noises, which is always a plus).

Following the initial firing and after shutting down and cooling off, Lombardi performed the usual checks (looking for leaks, checking and tightening up valve lash and adjusting the carb accelerator pumps, etc.).

On the very first pull, our big-block baby spit out 648 pound-feet of torque at 5,500 rpm and 707 hp at 6,000 rpm, with oil pressure at 83.9 psi at 3,500 rpm and 97.7 psi at 6,100 rpm.

After a bit of further minor tuning, she easily popped out 653.8 pound-feet at 5,500 rpm and 712.8 hp at 6,100 rpm. As with any build, additional tuning will likely improve those numbers, but for the brief time we had available on Ross Racing Engines' (very busy) dyno, we felt satisfied with these base numbers. There were no glitches during the runs, which gives any builder that warm and fuzzy feeling.

Returning to my shop, we drained the oil and opened up the oil filter with no

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PROJECT PARTS

Dart Big M block	312133444
Dart Pro 1 cylinder heads	19200000
Dart valve covers	68000040
Dart stud girdles	301-64110001
SCAT forged crankshaft	4-454-4250-6385
SCAT forged H-beam rods	2-454-6385-2200A
ICON pistons	IC516
Hastings piston rings (ICON P/N)	4500JS8-.005
AXE engine stand/cart	ESTD-40
COMP Cams solid roller camshaft	4028B/4032B R111 (4/7 swap firing order)
Morel Black Mamba solid roller lifters	6489
Harland Sharp roller rockers 1.7:1	SD 2001 (Diamond Series)
Elgin 1-piece pushrods	PR-13845S intake; PR-13940 exhaust
Melling billet oil pump w/driveshaft	10077-800SS
Cloyes Hex-A-Just timing chain set	9-3110A
Moroso oil pan	20420
Moroso valve cover breather (weld-in)	68800
Moroso oil pan gasket	93153
Moroso oil sump dipstick	25973
Stef's distributor hold-down clamp	30100
Cometic MLS head gaskets	C5036-040
Fel-Pro intake gaskets	1239
Fel-Pro rear main seal (2 pc)	2918
Fel-Pro exhaust gaskets	1412
Engine Pro billet timing pointer	14-61922
Engine Pro bellhousing dowels	29-2000-2
Engine Pro cam hardware kit	29-1001
Engine Pro pushrod checking kit	LC5A-K
Weiand Hi-Ram dual intake manifold	1985
Weiand dual carb linkage kit	4022
Holley 950cfm Ultra carburetors	0-80805 RDX
Holley billet fuel regulator	12-879
Earl's fuel Y-block	100181ERL
Earl's fuel pressure gauge	100189ERL
MSD distributor	8570
MSD spark plug wires	31199
Made-For-You wire holders	5095611
MSD ignition coil	8207
MSD IGN CD	6425
MSD crank trigger kit	8620
Spark plugs (gap 0.04-inch)	Autolite AR3924 or NGK BKR6E 6962
Meziere electric water pump	WP300
Fluidampr 8-inch balancer	800101
ARP cylinder head studs	235-4328
ARP intake manifold bolts	435-2101
ARP crankshaft bolt	235-2502
ARP distributor stud	430-1701
ARP carb studs (2.7-inch)	400-2402
ARP carb studs for linkage brackets (3.2-inch)	400-2412
ARP oil pump stud	230-7008
ARP oil pan studs	435-1902
ARP valve cover bolts (1/4-20x3.500-inch)	611-3500
MAHLE main bearings	MS829H
MAHLE rod bearings	CB743HN upper & CB743HXN lower
Dart block kit (includes cam bearings)	32000022
Dart block rear main port plug	Dart 3/4-inch O-ring AN 32892750
Dart block rear lifter galley plugs	Dart 1/2-inch O-ring AN 32892500
Dart block front oil galley and main plugs	Dart 1/2-inch O-ring AN 32892500
Dart valve cover gaskets	65322000
Thermostat neck	SUM-371100
PCV valve	SUM-440308-BLK
VDO water temp sender (1/2-inch NPT)	323-419
Melling oil filter adapter	MEL-MFA350
Moroso oil filter	Race 22460
Weiand air cleaner (Hilborn style)	7221
Mr. Gasket velocity stacks	46
FilterWears velocity stack 8.5-inch pre-filters	F181
Flowtech exhaust headers	31030FLT (ceramic coated)
Permatex gasket sealants	Optimum Max Flex & The Right Stuff
Akerly & Childs Xtreme cylinder wall & ring assembly lube	AC9900
Royal Purple Max Tuff bearing assembly lube	01335
Maxima Break-In oil	15W-50I
Maxima Performance running oil	10W-40

GOODSON TOOLS

Goodson indicator base	MBR-1F
Goodson dial indicator	EDI-0005
Goodson digital caliper	EEDC-06
Goodson oil galley cleaning kit	HPOG-1000
Goodson dial bore gauge	EBG-265
Goodson micrometer stand	MIC-FIX
Goodson crank measuring/inspection stand	PMIS-30
Goodson oil galley cleaning tool	High Pressure Cleaning Kit
Goodson cam bearing tool	CB7-300
Goodson crankshaft inspection stand	PMIS-30
Goodson pneumatic valve spring compressor	GSC-1000
Goodson CC measuring kit	CCB-Kit

ENGINE ASSEMBLY TORQUE SPECS

Main cap bolts (Dart spec with anti-friction lube)	100 lb-ft
Connecting rod bolts (ARP 2000 7/16x1.600 with lube)	70 lb-ft
Cylinder head stud nuts (with lube)	70 lb-ft
Cam gear to cam bolts	25 lb-ft
Timing cover bolts	106 lb-in
Water pump bolts	25 lb-ft
Oil filter adapter bolts	25 lb-ft
Intake manifold upper to lower bolts	18 lb-ft
Intake manifold to head (35 per Dart; 25 per Weiand)	30 lb-ft
Crank snout bolt	85 lb-ft
Rocker arm studs	55 lb-ft
Valve cover bolts	110 lb-in
Oil pump to rear main cap stud nut	65 lb-ft
Oil pan stud nuts	12 lb-ft (5/16) & 106 lb-in (1/4)
Water neck to manifold	25 lb-ft
Carb to manifold	60 lb-in
Fuel pump block-off plate screws	15-18 lb-ft
MSD crank trigger wheel to balancer	25-30 lb-ft
MSD crank trigger pickup bracket to block	25-30 lb-ft
Spark plugs	15 lb-ft

nasty surprises. Oil and filter were clean as a whistle. Color us happy.

Many thanks to Lombardi for interrupting his hectic race engine building schedule to handle the run session. ***TS***



MIKE MAVRIGIAN *owns and operates Birchwood Automotive in Creston, Ohio, where he builds custom engines and street rods, and performs vehicle restorations. He has written thousands of technical articles, as well as nine books on automotive technology during the past 30 years. Mike can be reached at (330) 435-6347 or birchwdag@frontier.com. Visit Birchwood's website at birchwoodautomotive.com.*

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KEEPING THE ENGINE RUNNING

A roundup of recent happenings surrounding the internal combustion engine.



Cosworth has been named engine partner for Red Bull's new RB17 hypercar. (Photo courtesy Red Bull)

Cosworth Named Engine Partner for Red Bull RB17 Hypercar Project

In England, Cosworth has been named engine partner for Red Bull's new RB17 hypercar, which was unveiled at Goodwood Festival of Speed.

Announced as part of Red Bull's 20th anniversary celebrations, the RB17 will feature Cosworth's latest powertrain technology. Engine development began in June 2023, when it was decided a 90-degree V-10 was the best solution to resolve all first order forces and moments to zero. Secondarily, the V configuration and firing order were chosen to maximize vehicle refinement attributes, according to an announcement.

Most notably, the engine will feature air valve spring (AVS) technology as the valve return actuation method. An innovation taken directly from F1, it enables 2000-09 V-10 models such as the Cosworth TJ2005 that powered the Red Bull's debut RB1 to rev beyond 19,000 rpm.

"Developing high-performance engines is what the company was created to do. Developing this V-10 for a multiple Formula 1 world championship-winning business such as Red Bull is fantastic for the Cosworth brand, especially when we can let this one ring out all the way to 15,000 rpm," says Dr. Florian Kamelger, Cosworth CEO. "We're thrilled to be building on our relationship with Red Bull and bringing together some of the greatest minds in the industry to produce a truly world-class machine. We're well underway with development—it's already been a year since we began the project and we're looking forward to sharing more about this enthralling partnership."

The RB17 engine speed will be electronically limited to 15,000 rpm, which is the same as today's F1 engines. The limit is part of the specification that enables Cosworth to meet Red Bull's engine life span requirement of approximately 15,000 miles while still delivering a memorable driving experience for the 50 future owners of the RB17.

In parallel with advances in engine design, Cosworth has also been evolving its emissions compliance development, ensuring the RB17 engine meets the stringent requirements of Euro 6 legislation.

A Smooth-Running Two-Cylinder for Hybrids

German-Austrian industrial organization Obrist Group has unveiled a compact two-stroke engine in a hybrid car that it says runs smoother than a 12-cylinder.



The Obrist Group's two-cylinder "champagne engine" is designed to be virtually vibration-free and can be used in hybrid applications. (Photo courtesy Obrist Group)

The company likes to demonstrate its Zero Vibration Generator (ZVG) mini-engine with a filled glass of champagne on top, because the liquid shows no movement when the two-stroke engine is running. The "champagne engine" is used in the Hyper-Hybrid concept being promoted by the group.

"HyperHybrid combines the advantages of electric mobility with the simplicity of the familiar refueling process, thereby solving the problem of range anxiety that is inherently associated with electric cars," says Frank Obrist, who has been developing the HyperHybrid concept with his team since 2011.

The mini-engine is not connected to the vehicle's drivetrain but is used solely for power generation, feeding an electric motor that drives the vehicle via a compact buffer battery. The vehicle runs on conventional fuel (gas or e-fuels) and consumption is kept low with a range of over 600 miles without refueling or recharging.

Technically a 1.0L naturally aspirated engine with multichannel fuel injection, the engine always runs in the optimum rev range. There is no need for variable valve timing, which is common in drive engines, and two crankshafts operate in opposite directions, eliminating vibrations.

A rubber-damped gearbox on the second crankshaft minimizes noise and an integrated flywheel compensates for all the inertias of the rotating parts, including external forces outside the engine such as the oil system with the oil pump.

As a result, and with complete encapsulation in a soundproofing box approximately the size of a shoebox, the engine was shown to operate virtually noiselessly and vibration-free.

2024 PRI Show Registration Opens



The 2024 PRI Show is set for Dec. 12-14 in Indianapolis. (Photo courtesy PRI Show)

Registration for the 2024 PRI Show, called "the premier business event for the motorsports industry," is now open.

Taking place Dec. 12-14 at the Indiana Convention Center and Lucas Oil Stadium in Indianapolis, the 2024 PRI Show will connect buyers with representatives from over 1,000 exhibiting companies showcasing their latest products, services, machinery, simulation and testing technologies, trailers and more.

"The PRI Show is the only place that brings together the motorsports industry's leading manufacturers, showcasing the latest products and technologies, and the racing audience that embraces them. All of this is done in a manner that offers immense networking and connectivity that remains unmatched, providing tremendous value," says Michael Good, PRI president. "PRI is committed to helping motorsports businesses succeed, and we're able to support the industry through a robust PRI Show and an evolving membership program, which facilitate our ongoing legislative advocacy, market research and bringing value to the industry 52 weeks a year."

Special features that give attendees access to products and live demonstrations include:

- *Featured Products Showcase*—a display of the newest and most popular motorsports products.
- *PRI Show Education Program*—a comprehensive lineup of seminars that offers attendees opportunities to learn valuable strategies, insights and solutions on a variety of subjects.
- *TOPS HQ*—an exclusive workroom and lounge where track operators, promoters and sanctioning bodies can connect during the three-day event.
- *Trailer Exhibit Area*—a place where attendees can make side-by-side comparisons of the latest race trailers, motorcoaches, haulers and toterhomes
- *PRI Paddock*—a dedicated stage where leading podcasters will perform live interviews with key industry personalities.
- *Sim Racing Arena*—an area where attendees can fully immerse themselves in the world of sim racing.
- *Machinery Row*—section featuring precision machining equipment wired for live demonstrations.

"Enthusiasm for this year's PRI Show is high. The motorsports industry is eager to come together and prepare for the upcoming racing season," says Karin Davidson, PRI Show director. "The PRI Show is the only motorsports event where you can connect with leading brands, attend unique conferences and seminars, and network with key industry figures—all under one roof."

For more visit pri2024.com/attend. **TS**



ENGINE PRODUCTS

The Latest Under-Hood Offerings



Top Hat Repair Sleeves

L.A. Sleeve, Santa Fe Springs, California, offers Straight Wall and Flanged Top Hat Repair Sleeves. Manufactured in the U.S. from its Moly2000 centrifugally spun-casted iron, the sleeves have a Brinell hardness of 200 to 250 (92.7 Rockwell B) with greater density, providing consistent grain flow micro-structure. The process involves patented procedures to control desired graphite matrix distribution throughout the sleeve. Moly2000 is shock-resistant to ensure piston rings are riding a stable bore surface, improving ring seal and compression boundaries.

Mustang Fuel Pump Module



DeatschWerks, Oklahoma City, presents its X3 Series Fuel Pump Module, now available for 2011-24 Ford Mustangs. Designed to include accommodations for up to three pumps, integration of a return fuel line and retention of all functionalities of the OE module, the DW X3 Series setup consists of a top-hat, center section, installation kit and bucket that work together to deliver improved flow. The system supports 1,700-plus whp on pump gas and optional plumbing kits are available.



Sniper 2 Cable Mounting Bracket

Lokar, Knoxville, Tennessee, presents a Throttle, Kickdown and Cruise Control Cable Mounting Bracket tailored specifically for **Holley**'s Sniper 2 EFI systems, ensuring a seamless and tidy cable installation. The versatile brackets cater to various setups, accommodating throttle cable only, throttle/kickdown, throttle/cruise control or throttle/kickdown/cruise control cable configurations. They are precision-machined from aluminum, available in Lokar's Brite or black anodized finishes and are designed to accommodate Lokar control cables exclusively.

Passenger Car Motor Oil



Hot Shot's Secret, Mt. Gilead, Ohio, presents its new Red Diamond Ultimate passenger car motor oil. Formulated to fully meet General Motors dexos1 Gen 3 specifications to keep the oil cleaner for longer while improving performance, engine system protection, mileage and horsepower, the blend uses 100% Group III base oils and is infused with proprietary FR3 Nano Technology. It is suitable for hybrid and internal combustion engines, especially small-displacement, turbocharged GDI engines where it can protect against low-speed preignition.



Honda/Acura Intake

PRL Motorsports, Export, Pennsylvania, presents a High-Volume Intake System for 2022-newer Honda Civic FL5 Type-R and 2023-newer Acura Integra applications. Designed to provide a factory-like fuel trim for optimal drivability, the intake system/MAF housing fits the factory turbocharger inlet pipe only, with no ECU calibration required. Systems include a 6-inch cone air filter, HDPE rotomolded air box and secondary air duct to increase overall airflow.



DEF Treatment

Rislone, Holly, Michigan, presents new Diesel DEF Treatment. The unique formula protects SCR and diesel exhaust fluid (DEF) systems against harmful deposits that can otherwise build up and reduce engine performance, increase fuel consumption and eventually keep the vehicle from running. The maintenance product can be added with every fill-up in diesel cars, trucks or SUVs. It improves DEF fluid performance and prevents white crystallization deposits from forming anywhere in the system, including the tank, pump, heater, sender, lines, injector and mixer.

Gen-III Hemi-Compatible Performance Crate Engines



BluePrint Engines, Kearney, Nebraska, presents a comprehensive range of Gen-III Hemi-Compatible 426-ci Performance Crate Engines. The lineup includes various options, from long-block configurations to fully assembled engines complete with ECUs, wiring harnesses and front drive accessories. Customers can also choose between naturally aspirated or supercharged versions to suit their performance needs. All engines undergo dyno testing, ensuring 610- to 872-hp guaranteed power levels.

Racing Oil



Pennzoil, Houston, presents its new Pennzoil Performance+ Racing Oil using re-refined base oil (RRBO) to deliver top engine performance with fewer greenhouse gas emissions. Used by IndyCar teams during the Indianapolis 500 and throughout the NTT IndyCar Series, the oil conserves nonrenewable resources by reducing its use of base oils made from primary fossil material. Combining RRBO with premium additives, Pennzoil Performance+ Racing Oil delivers a 15% reduction in greenhouse gas emissions compared to 2023 Pennzoil racing products.

Ford 6.7L Air-to-Water Intercooler Kit



Pacific Performance Engineering (PPE Power), North Las Vegas, Nevada, presents the PPE high-performance Water-To-Air Intercooler, designed to add style and performance to 6.7L Power Stroke engines. The intercooler has increased cooling efficiency due to its all-aluminum bar and plate-style construction, superior fin layout and 50% larger core. The coolant's distribution path is redesigned to maximize cooling capacity and efficiency. Cooler, denser charge air can also help reduce exhaust gas temperatures (EGTs) and increase fuel efficiency.

Full Race Ignition System



JMS, DeBary, Florida, presents the JMS Daytona CD-1 capacitive discharge system and companion coil, engineered to optimize the potential of distributor and crank trigger-based ignition systems on all 4-, 6- and 8-cylinder engines. Suited to virtually all motorsports and high-performance street applications, the controller boosts performance and can be programmed to handle functions that include three-step rpm limits and high gear or nitrous retard. It employs a user-configured timing curve based on boost or rpm. ***TS***



Fleet Work p. 50 / Second Shop p. 54 / Restyling Products p. 55

AN ORGANIZED APPROACH

By Jef White

Versatile & efficient, cargo management solutions help make life easier.



Make sure your cargo management products are easily found online as well as in-store. (Photo courtesy Lippert)

Whether your customer is a fleet owner with unique commercial needs, an overlander hoping to get away from it all or a suburban family looking to maximize SUV storage space, there's an aftermarket cargo management solution that fits the bill.

Versatile and efficient, today's systems add utility and a touch of personalization to any vehicle, appealing to all types of customers hoping to take it all with them.

Oftentimes the most difficult aspect of cargo management sales is getting drivers familiar and comfortable with the wide variety of options available. From there, accessory add-ons and installation services can become part of a total cargo carrying package.

Suppliers are ready to help with the introductions, offering observations on market trends, sales techniques and the hottest new products, meaning now's the time to get started on an organized approach to boosting the profile of your cargo management solutions.

UNIVERSAL APPEAL

Fleet and professional customers can be a good place to start when it comes to offering cargo management products and systems.

Kenny Austin, general manager at Tmat Products, recognizes how "work organization" is greatly expanding the market for solutions such as stackable interlocking toolboxes.

"Milwaukee Tool's PACKOUT system is red hot, but so are many other brands," he reveals.

It's important to remember, however, that despite business accounts and the need to use specialized vehicles to perform their services, commercial customers still face some of the same economic challenges as retail clients.

"Economic downturns are significantly affecting company budgets, particularly in transportation and cargo management," notes Sara Ford, marketing manager for TrailFX. "As businesses face financial strains, many are compelled to cut costs, leading to reduced spending on transportation and investment in advanced cargo management solutions.

Thankfully, everyday pickup owners are also prime targets for the wide variety of versatile cargo management solutions available for today's market.

"Now that trucks are family vehicles, the bed is more than a utility compartment—it's become an extension of the interior," observes Tony Savasta, VP of marketing for Westin Automotive. "We offer a custom-fit bed mat to add cushion and protection to the bed, and we are releasing a whole

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LIPPERT

Cargo Management Products

HOT PRODUCT:
ActiveLink Cargo Carrier System
FEATURES & BENEFITS:
Carriers, bike racks and ball mounts allow quick swaps of hitch attachments without tools; made for active enthusiasts who demand flexibility and speed to keep up with their lifestyle.

Lippert
Kristi Feeney
Director of Marketing, Automotive Aftermarket

HOT PRODUCT:
Tmat Truck Bed Organization
FEATURES & BENEFITS:
Accommodates brand-specific storage accessories including mounts, blockers and wheel cribs; can be quickly installed and used out of the box; allows custom installs and setups in fleet vehicles, vans, campers and other applications.

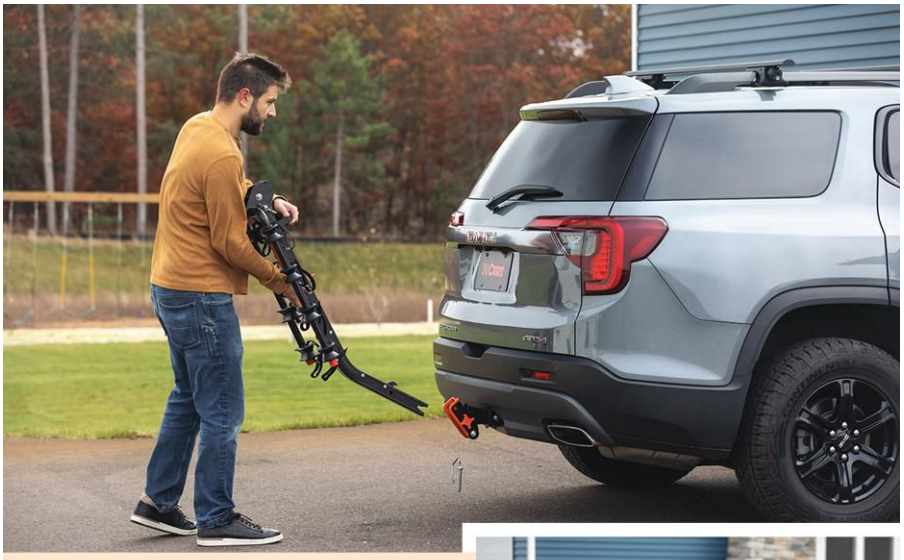
Tmat Products
Kenny Austin
General Manager

HOT PRODUCT:
Premium Heavy-Duty Contractor Rack
FEATURES & BENEFITS:
Engineered to safely transport heavy equipment and materials up to 1,500 pounds; rugged design with black powder-coated steel tubing; high-strength steel cleats welded to each upright; rear hand grabs; adjustable to fit both long- and short-bed pickups.

TrailFX
Sara Ford
Marketing Manager

HOT PRODUCT:
EXP Topper Truck Cap
FEATURES & BENEFITS:
Insulated, double-wall aluminum modular construction for strength and ease of assembly; full-length door hinges offer durability and long life; convenient single twist-to-open handles; inside emergency release handle; electronic back hatch.

Westin Automotive
Tony Savasta
VP Marketing





Oftentimes, seeing is believing when it comes to cargo management product sales. (Photos courtesy Lippert)

line of racks and accessories to complement the EXP Truck Topper for storage and comfort."

A SOLUTION FOR EVERYONE

While it makes sense to target commercial customers for aftermarket cargo solutions, the products are also attractive to retail and household consumers as well.

"These systems offer significant advantages for personal vehicles and recreational use. Whether you're transporting tools, sports equipment or outdoor gear, effective cargo management helps keep your load organized and secure," says Ford. "From truck bedliners and adjustable racks to tie-downs and custom storage solutions, these products enhance safety and efficiency for any vehicle owner. Embracing cargo management technology isn't just a commercial necessity—it's a smart investment for anyone looking to maximize their vehicle's versatility and performance."

Drivers may turn to you for specialized solutions to unique hauling requirements. In-person introductions can help them see



Immediate availability and professional installation services streamline the purchase journey. (Photo courtesy TrailFX)



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AN ORGANIZED APPROACH








"Work organization" is greatly expanding the market for cargo management solutions. (Photos courtesy Tmat Products)

the endless possibilities today's solutions deliver.

"Outdoor enthusiasts prefer to touch and feel the products prior to purchase, so in-store displays are a must," says Kristi Feeney, director of marketing – automotive aftermarket, for Lippert.

Many consumers turn to professionals for product recommendations and help setting them up on the vehicle, meaning shops will want to get comfortable with assembling and mounting the systems.

"Some of the larger cargo management products like toolboxes, truck caps and overland racks may seem intimidating to install. They do take more space to preassemble and have specific assembly steps," says Savasta. "We go to great lengths to publish clear and comprehensive instructions to make the installation as smooth as possible, and our customer service department is always available to assist if there are any questions. We find that once a technician has done an installation or two, they are pleased to find it's easier than they initially thought."

READY WHEN YOU ARE

Keeping popular cargo management solutions on hand allows shops to serve "want it now" customers.

"Consider offering universal products that are readily stocked and available for immediate installation," says Ford from TrailFX. "By keeping a range of versatile, high-demand cargo management solutions in-store, shops can cater to diverse customer needs without delays."

This approach not only improves the efficiency of the buying process but also boosts customer satisfaction by providing quick, on-the-spot remedies for cargo carrying challenges, she continues.

"Immediate availability and professional



Shops will want to get comfortable with assembling and mounting the systems. (Photos courtesy Westin Automotive)

installation services streamline the purchase journey, making it more convenient for customers and increasing the likelihood of repeat business," says Ford.

Tmat's Austin believes a comprehensive approach delivers the highest consumer satisfaction.

"Cargo management shouldn't be in addition to your customer's favorite storage solution—it should be built around it," he advises. "Show how your customers can use your solutions with their favorite portable storage brands."

Meaningful conversations focused on expected vehicle use and future plans can help shops create the ideal cargo management setup for each driver.

"Always ask the customer what they would like to accomplish with the installation of cargo management products. Explore how they use their truck and talk about all the options. Make a total plan for their desired accessories, so if budget is an issue, they can build their dream truck in stages and return to continue the upgrades," says Westin's Savasta. "The daily work truck owner may have a need for a ladder rack or one of our Brute toolboxes. Campers and overlanders may want a truck cap with a bed mat and cargo racks."

He also agrees that a healthy inventory will spur add-on purchases.

"It's good idea to keep plenty on hand so you can use them as a sales tool to build a complete package for your customer," he advises.

When looking for maximum exposure, it pays to also have your cargo management message prominently displayed online, notes Lippert's Feeney.

"The path to purchase is an omnichannel journey that shops should always be considering," she notes. "For many, the journey starts with research online—being found in the research phase is critical. Make sure your website content lists these products and services to increase your organic search ranking." ***TS***



PARTNERING ON FLEET SERVICES



Photo credit: stock.adobe.com

Commercial vehicle upfitting offers chances to boost efficiency & safety. **By Chris Johnston**

Fleet operations are crucial for the everyday success of companies in the mobile maintenance and service industries that maintain and repair vehicles and equipment, either on the road or at a customer location.

With the need to reduce operating costs, vehicle upfitting—tailoring vehicles to meet specific functional needs—is an essential strategy for companies that want to enhance their fleet performance.

As expert upfitters, specialty aftermarket shops can look to partner with maintenance and service peers to boost operational efficiency and safety for fleet customers.

MEETING FLEET NEEDS

Upfitting standardizes vehicles across fleets, equipping them with uniform features and equipment.

This uniformity simplifies operations, facilitates training and makes maintenance more manageable. It can lead to cost reductions and enhance the overall management of the fleet.

Safety enhancements are among the most significant benefits of upfitting. Advanced safety features such as back-up cameras, improved lighting and collision avoidance systems can protect drivers and reduce accident rates, especially at busy jobsites.

These upgrades are crucial for safety and help minimize the company's liability risks.



Tailoring vehicles to meet specific functional needs is an essential strategy.

KEY CONSIDERATIONS FOR FLEETS

The process starts with the client selecting the appropriate vehicles based on size, payload capacity, fuel efficiency and maneuverability. Each vehicle should be viewed as a tool designed for specific tasks, ensuring drivers have the right equipment to execute their jobs effectively.

Upfitting must comply with current safety regulations and industry standards. As an industry service provider, Merchants Fleet is up to date on these standards and can integrate essential safety features into vehicles that are upfitted for a company if questions arise.

A commitment to safety helps minimize the risk of accidents and enhances the welfare of the workforce.

VEHICLE DESIGN & OPERATIONAL SUCCESS

The design of fleet vehicles,

including considerations like vehicle weight, significantly impacts their operational efficiency.

Managing vehicle weight optimizes fuel efficiency, maximizes payload capacity and improves handling and performance. It also ensures compliance with regulations and reduces maintenance costs by minimizing wear and tear.



As expert upfitters, specialty aftermarket shops can look to partner with maintenance and service peers to boost operational efficiency and safety for fleet customers.

UPFITTING ESSENTIALS

There are many things to consider when upfitting a vehicle for use in mobile maintenance. This includes modifications designed to enhance functionality, safety and efficiency.

Here are some items that may be included when upfitting:

Storage Solutions

- ***Toolboxes:*** Secure and weather-resistant units for storing hand and power tools.
- ***Shelving Units:*** Custom configurations to efficiently organize materials and tools.
- ***Rack Systems:*** Used for transporting larger equipment.

Safety Features:

- ***Beacon Lights:*** Enhance visibility on the road or at a jobsite, especially in poor lighting conditions.
- ***Back-up Alarms:*** Alert others when the vehicle reverses, crucial for preventing accidents.
- ***Safety Partitions:*** Installed between the cab and cargo area to protect occupants from shifting loads during transport.

Heavy-Duty Upgrades:

- ***Heavy-Duty Suspension:*** Reinforced to support additional weight from equipment and supplies.
- ***Reinforced Tires:*** Puncture-resistant with the proper load rating and designed for rough terrains.
- ***Engine Upgrades:*** Enhanced cooling systems and larger engine sizes can be considered for vehicles used for heavy





As expert upfitters, specialty aftermarket shops can look to partner with maintenance and service peers to boost operational efficiency and safety for fleet customers.



Upfitting standardizes vehicles across fleets, equipping them with uniform features and equipment.

loads or those needing added towing capacity.

Power & Electrical Modifications:

- *External Power Outlets:* Facilitate using electrical tools without additional power sources.
- *Upgraded Electrical Systems:* Support additional lighting and electronic equipment.

Exterior & Interior Modifications:

- *Towing Packages:* Includes hitch receivers and trailer wiring for towing.
- Utility Racks: For transporting bulky or oversized items.
- *Durable Floor Linings:* Protect the interior from damage and make cleaning easier.
- *Ergonomic Seating:* Supports long hours of driving or operation with enhanced comfort.
- *Custom Paint or Graphics:* Add company branding and enhance visibility.

Communication & Navigation Systems:

- *GPS Tracking:* This is for efficient fleet management and navigation to jobsites.
- *Mobile Communication Systems:* Include two-way radios or cellular boosters for improved communication in varied environments.

Custom Tailoring for Specific Needs:

- *Crane & Winch Systems:* For lifting and moving heavy materials.
- *Compressed Air Systems:* Integrated compressors for powering pneumatic tools.

Choosing durable materials for upfitting components ensures that they can endure daily operations and adverse conditions, extending the vehicle's life span and reducing the frequency and costs of maintenance.

EMERGING TRENDS & TECHNOLOGIES

The integration of telematics with upfitting solutions is transforming fleet management.

Real-time data from GPS tracking, sensors and onboard diagnostics provide insights that enable route optimization, predictive maintenance and enhanced driver performance monitoring.

OVERCOMING COMMON CHALLENGES

Effective cost management is crucial when upfitting vehicles used for mobile maintenance.

Despite the initial investment required, employing strategies such as doing research to identify cost-effective upfitting solutions

can help manage expenses without compromising safety or quality.

Additionally, reducing downtime is another critical consideration. Planning the upfitting work during off-peak hours or aligning it with already-scheduled vehicle maintenance can significantly reduce operational disruptions.

Merchants Fleet works with customers to streamline and expedite the process, further reducing downtime and ensuring that vehicles are back in service as quickly as possible.

THE ROLE OF DATA

Data and analytics play a crucial role in optimizing the upfitting process. By analyzing vehicle performance data and market trends, fleet managers can make informed decisions that improve efficiency and productivity.

This data-driven approach allows for continual adjustments and enhancements to fleet strategies. Work with your customers on the best decisions for their unique circumstances.



The design of fleet vehicles significantly impacts their operational efficiency.

THE FUTURE OF VEHICLE UPFITTING

Integrating advanced technologies like artificial intelligence (AI) and automation will further revolutionize vehicle upfitting.

Innovations in smart sensors and autonomous capabilities will enhance monitoring, maintenance and efficiency, paving the way for more innovative, safer and cost-effective fleet operations.

In conclusion, vehicle upfitting is essential to help mobile maintenance companies maximize their performance and reliability. By embracing new technologies, prioritizing safety and utilizing data analytics, fleet managers can ensure their fleets are equipped to meet today's challenges and are prepared for the future.

Aftermarket shops can be the professional partners they need to ensure efficiency and safety are top priorities. ***TS***

CHRIS JOHNSTON *is fleet operations manager, short term vehicle ordering, for Merchants Fleet, which has been providing highly customized fleet management and fleet leasing solutions for more than 60 years. Learn more at merchantsfleet.com.*





Growing your business by opening a second location is a proven way to scale your shop. (Photo by Egor Vikhrev on Unsplash)

TIME TO GROW?

Four signs you should consider expanding to a second location.

By Charles J. Bonfiglio

In the automotive industry, we all get used to working hard and keeping long hours. When you first open a business, those investments of time and effort are often necessary.

As your business matures, however, constantly putting in overtime may mean it's time to examine your operations. Consistently working long hours could be a sign of inefficiencies or staffing shortages.

On the other hand, it may mean that you're enjoying great success and it's time to seriously consider expanding.

Growing your shop by opening a second location is a proven way to scale your business. If the timing is right and you execute a thoughtful strategy, you can see a multiplying effect in terms of productivity, revenue, customer satisfaction and profitability.

And you may even find that you finally have more time and energy to enjoy those rewards.

How can you know when it's time to open a new location? There's no simple formula. However, here are some signs that may signal your business is ready to expand.

1 HEAVY DEMAND

When customers are regularly waiting for products or services because your staff can't keep up with demand, a second location can enhance their experience—and ensure they'll keep coming back instead of looking for another business to meet their needs.

A new store expands your physical space and staff, so you have more capacity to deliver excellent service efficiently.

Sharing some inventory, equipment and staff between the two locations allows you to double capacity without doubling your expenses. That increases your profitability rate.

You're also providing a better experience and greater value for customers, building loyalty that leads to repeat business and referrals.

2 POSITIVE INDUSTRY TRENDS

When an industry is on an upward trajectory, like the automotive aftermarket sector is at the moment, expanding your business in anticipation of rising demand may be a winning strategy.

Not only will you get ahead of your competitors and discourage new businesses entering your market, but you also have an opportunity to streamline your company's growth.

Keeping yourself connected to industry trends can equip you with valuable knowledge that can inform decisions about inventory, new services and products, staffing and, ultimately, when it's the right time to grow.

3 UNDERSERVED MARKETS

If customers outside your immediate service area come to your store repeatedly, that's a good sign. It either means your brand is worth the extra distance, or there's an untapped market nearby.

Either way, you can be confident that a built-in supply of new customers is accessible with a strategically chosen second location.

4 METRICS

If you're meeting goals across meaningful metrics—from leads, customer and employee retention, productivity and revenue—it's time to start thinking about how to invest back into the business.

Opening a second location isn't the only option. You could also consider adding new services or product lines to attract new business or hiring more team members to enhance customer experience.

If the numbers say it's time to grow, don't ignore the message.

CAREFUL CONSIDERATION

Expanding your business at the right time isn't just about taking advantage of new opportunities. Failing to expand or waiting too long to act can have serious negative consequences.

If you can't meet consumer demand for your products and services, customers may take their business elsewhere.

Staying small while competitors grow could reduce your shop's market share and profitability.

Leaving money on the table is one thing. Failing to respond when the competition starts picking it up is another.

This article originally appeared online at theshopmag.com. Visit today and sign up for the free daily e-newsletter. ***TS***



CHARLES BONFIGLIO *is president and CEO of Tint World, a provider of automotive, residential, commercial, and marine window tinting and security film services. With Automotive Styling Centers in the U.S. and abroad, each franchise location houses approximately 20 profit centers, ranging from in-store accessory installations to offsite sales and installation.*

Delta Tech Industries



Durimex, Inc. was founded and incorporated in 1978 in Anaheim, California, doing business as Delta Tech Industries. It currently offers over 600 SKUs of automotive headlights, auxiliary lights, fascia fog lights, light pods and light bars.

Over its 46-year history, the company has advanced through three major transitions in lighting technology—halogen, H.I.D. and LED. Known for its high-quality, domestic manufacturing, Delta Lights has earned its reputation among truck and Jeep owners, heavy-duty truckers, classic car enthusiasts and hot rod owners for originality and exceptional attention to detail.

Delta Tech was the inventor of light bars in the early 2000s with the introduction of H2 Hummer and is currently offering over 20 models for every truck and SUV. Delta Lights has revolutionized the Jeep and classic car headlight market by currently offering over 100 distinct models, more than all other light manufacturers combined.

The distinct attributes for which Delta Lights is well known are prismatic optic glass lenses, metal vacuum-metalized reflectors, and three mounting options of mounting lights and light bars—bolt-on, magnetic and vacuum cup.

Delta also recently developed and patented a five-function fascia-grille light assembly for Corvette C8s, along with a prototype of tactical headlights for the U.S. Army.

Delta Lights has been trusted by many in the OEM industry such as General Motors, Sylvania, Truck-Lite, Grote Industries, NAPA and Mitsubishi USA. Our design engineers are currently working on lights designated for the industrial and agricultural markets to assist the ever-growing need for good, energy-efficient lighting for industry and night farming.

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Truck Fender Flares

EGR USA, Ontario, California, introduces its new Fender Flares, designed to provide enhanced protection and a rugged off-road look for a variety of truck models. The flares are crafted from durable materials, ensuring long-lasting performance and an improved aesthetic. They are robotically CNC-cut in the USA for a precise fitment and offer easy, no-drill installation. Available applications include a variety of Ford Super Duty, GMC/Chevrolet and Dodge/Ram truck models.

High-Fidelity Round Subwoofers

KICKER, Stillwater, Oklahoma, introduces the CompQ Series, the latest release in its line of high-performance, low-frequency subwoofers. Considered the company's best round subwoofer line, the elite, round-coned CompQ Series features 10-, 12- and 15-inch models available at 2 or 4 ohms. The subwoofers are built to achieve audiophile sound quality with a smooth frequency response and are also capable of high sound pressure levels (SPL). Features include Forced-Air Cooling for increased performance and durability.





Jeep Rocker Guards

Artec Industries, North Salt Lake, Utah, presents its expanded line of premium Rocker Guards, now featuring three new products for Jeep Wrangler and Gladiator models. The JL0300 Bolt-On Aluminum Rocker Armor, JL0301 High Clearance Boatside Rocker Guards for the JLU Wrangler, and JT0401 High Clearance Boatside Rocker Guards for the JT Gladiator are designed to deliver durability and protection to address the specific needs of Jeep enthusiasts. The guards are created using advanced materials and precision engineering for maximum performance.



Heavy-Duty Truck Electronic Locking Differential

Auburn Gear, Auburn, Indiana, presents its American-made Electronic Open-to-Lock Differential for 2001-19 Chevrolet, Dodge, Ram and GMC heavy-duty trucks. Made from military-grade materials and designed to handle the tough daily demands that single- and dual-wheel trucks face in construction, mining and transportation, the system uses a flip of a switch (no air compressor or hoses required) to instantly lock the rear 11.5-inch **AAM** 30-spline axles to the differential housing, ensuring 100% torque transfer.



All-Season Tires

Nitto Tire, Cypress, California, presents the Motivo 365 all-season tire, designed to improve performance, versatility and driver confidence. Offering a 3PMS snow rating and modern tread and compound technology, the tire delivers upgraded traction and handling in all weather conditions. Its unique full silica compound earns it the three-peak-mountain-snowflake designation. The Motivo 365 will be available in 69 sizes upon full launch, ranging from 17- to 20-inch rim diameters, fitting many passenger cars and CUVs.

Wrap Films

Arlon Graphics, Placentia, California, introduces its new VITAL non-PVC product range, including DPF V9700 premium cast polyurethane film featuring FLITE Technology designed for improved performance in full or partial vehicle wraps and fleet vehicle branding, and Series V3370 premium cast polyurethane gloss overlaminate that provides scratch recovery properties, chemical resistance and extended durability. The films are the result of extensive research and development efforts, designed for performance, innovation and environmental responsibility.



Jeep Dual Load-Carrying Ball Joints



Rare Parts Inc., Stockton, California, presents Dual Load-Carrying Ball Joints for a variety of Jeep vehicles. Designed to balance the steering system using load-carrying upper ball joints and heavy-duty lower ball joints, the made-in-the-USA systems are fully greaseable and fit OE Jeep axles without modifications. The upper ball joint features an adjustable pre-load with a tapered nickel-alloy stud and durable pivot bearings designed to carry 20% of the steering load. The lower ball joint handles the load more effectively with a steel-on-steel powdered metal bearing.

Jump Starters With Internal Charger



Schumacher Electric Corporation, Fort Worth, Texas, presents the relaunch of five DSR Pro Series Jump Starters that will be sold under the DSR165, DSR166, DSR167, DSR168 and DSR168/G model numbers. The products now feature an internal charger with peak amps ranging from 2,200-4,400, making the class of heavy-duty, high-performance jump starters truly portable. The efficient internal chargers in the units work with any extension cord.

Ceramic Wash

303, Chicago, a premium **Gold Eagle Co.** brand, presents 303 Ultra Suds Ceramic Wash, an all-in-one car wash that foams quickly to lift dirt and grime, add ceramic protection and enhance paint gloss and depth. Containing SiO2 (silica), the product leaves a layer of ceramic protection with a hydrophobic barrier that provides durable protection in all weather conditions and leaves a high-gloss shine. Developed to be used as a topper or maintenance product, the pH-neutral formula and high lubricity level prevents scratches and won't strip a vehicle's current coating.



Aerodynamic Rooftop Tent



Roofnest, Boulder, Colorado, introduces its Falcon 3 EVO and Falcon 3 EVO XL Rooftop Tents. Designed for sturdiness, warmth, spaciousness and aerodynamics, the Falcon 3 EVO combines the best features of the all-aluminum Falcon 2 and Falcon Pro clamshell rooftop tents with the weather-proof and ruggedized construction of the Condor 2 foldout lineup. The tents are comfortable for campers up to 6-foot-2, with a top shell that opens to a 43-degree angle. They allow for the storage of light bedding even when the tent is closed.

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Rooftop Tent

iKamper, Kent, Washington, introduces the Skycamp DLX Deluxe Rooftop Tent. Building on the foundation of the Skycamp 3.0, Skycamp DLX combines a proven design with sought-after modifications including integrated LED lighting, 4-inch self-inflating mattress and natural cork floor lining. The fold-out design doubles the sleep area, creating a generous platform for rest while remaining compact when stored. A low-profile, insulated, fiber-reinforced shell and strong aluminum honeycomb base blend long-lasting fabrics with heavy-duty components.

Jeep JL/JLU Long-Arm Upgrade Kit

Synergy Mfg., San Luis Obispo, California, presents its Synergy Jeep JL/JLU High-Clearance Long-Arm Upgrade Kit. Designed to deliver enhanced off-road performance and ride quality, the kit offers increased suspension articulation and stability while maximizing ground clearance. The long arms are crafted from 1/4-wall 2-inch DOM steel and the high-clearance brackets are made from 1/4-inch Grade 50 A-570 laser-cut plate steel. The 100% bolt-on system fixes caster change, anti-dive and roll axis geometry issues inherent with short-arm systems.





Portable Power System

REDARC, Lonsdale, South Australia, presents the 1,200-watt GoBlock Portable Dual-Battery System. Engineered to be used as both an in-vehicle dual-battery system and a portable power station, GoBlock includes retractable handles and lithium iron phosphate (LiFePO4) battery cells with a life cycle of 2,000 charges. An in-vehicle docking station allows a rapid 50A recharge rate and keeps the system securely fastened in the vehicle. Using Bluetooth technology, it can connect to the RedVision smartphone app.



In-Bed Auxiliary Fuel Tanks

Transfer Flow, Chico, California, presents Auxiliary Fuel Tanks available in a variety of sizes ranging from 37 to 100 gallons. Designed to deliver extra fuel capacity for long hauls, RVing, off-roading adventures or everyday convenience, auto-transfer auxiliary fuel tanks seamlessly integrate with trucks, offering convenience and reliability. The TRAX 4 operating system ensures fuel transfers are smooth and efficient, without requiring any manual intervention. The auxiliary fuel tanks are made in the USA and manufactured from American-made aluminized steel.



RV & Marine Batteries

OPTIMA Batteries, Milwaukee, Wisconsin, presents ORANGETOP Q31M-DC150 and Q31M-DP120 Batteries, designed to deliver power, reliability and performance for a variety of marine and RV applications. The Q31M-DC150 is a deep-cycle battery with a 150Ah capacity that is ideal for use with trolling motors or as an RV house battery. The Q31M-DP120 is a dual-purpose battery for engine starting and deep-cycle applications with 1,200A of cranking power and a 120Ah capacity. Both utilize QUAD terminals for a wider array of fitments and easy installation.

LED Scanning Hood Brow

Race Sport Lighting, Ringwood, Illinois, offers the HOODKIT2 LED Knight Rider Scanning Hood Brow DRL Flex Cool White Kit. Designed to enhance the aesthetic appeal and visibility of cars and Jeeps while providing a modern and stylish touch, the highly flexible light kit contours along the bottom of the hood lid. It offers a distinctive scanning effect upon ignition before the final transition into a solid daytime running light.





Silverado Fender Flares

Air Design, Oceanside, California, presents OE Style Fender Flares for 2019-23 Chevrolet Silverado models. Designed for rugged elegance, the flares also improve airflow around the engine bay and provide a noticeable sharp driving feel at medium and high speeds.

EV Tire



Lexani Tires, Irwindale, California, presents its new Volt-EC EV tire. Aimed at vehicles such as the Tesla Model 3, Ford Mustang Mach-E, Toyota Prius and Chevy Volt, the ultra-low rolling resistance tires help extend the range of electric vehicles while outperforming in wet weather conditions. They are designed to ensure a quiet and comfortable ride and are available in more than 20 sizes.



Silverado/ Sierra Console Safes

Tuffy Security Products, Cortez, Colorado, presents a new Console Safe for 2021-current Chevrolet Silverado/GMC Sierra pickups with a wireless charging pad. The safe's quick-access keyless entry is equipped with a three-digit combo lock and maintains the completely stock look of the original center console. Fully integrated and concealed, it accommodates the OE internal lights, USB, SD and AUX ports. The product is designed to keep fingers safe with an exclusive lid support bracket.

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Windshield Film

XPEL Inc., San Antonio, introduces its new Windshield Protection Film. The clear, thin film is applied to the outside of a windshield to help make it more impact-resistant and prevent costly rock chips, pitting and cracks. The film features high-quality optical clarity that does not reduce visibility or impact how windshield sensors perform. It is designed to be professionally applied.

Bike & E-Bike Rack

1UP USA, Dickeyville, Wisconsin, presents its new Super Duty Bike and E-Bike rack. Featuring a modular design compatible with all Quik Rack add-ons, the SD offers improved capability, ruggedness and versatility to carry bikes farther into the backcountry. A new SD Roof Rack is also available.

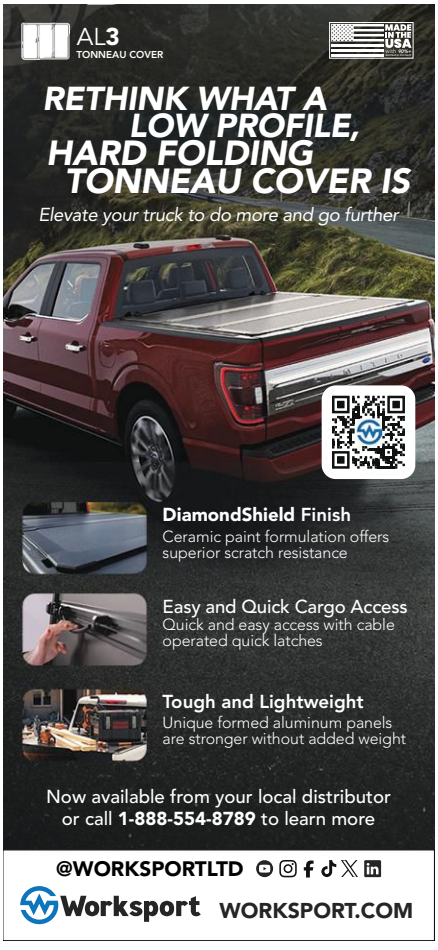




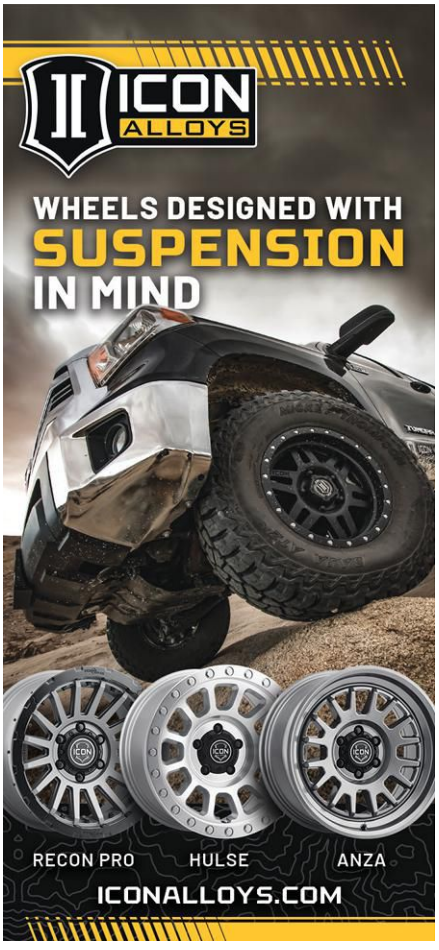
AEV Jeep Suspension Upgrade Kit

ORZ USA, Carson City, Nevada, presents its **Bawarrion** brand GEORISE Upgrade Kit for all **AEV** Jeep JL and JT suspensions. Designed to raise the driving dynamics of AEV-equipped JL or JT models, the upgrade kit corrects geometry for the front track bar, rear control arms and steering for improved safety, handling, ride quality and control. The included cast steel knuckles provide high steer and increased ground clearance for OE or aftermarket steering components. ***TS***

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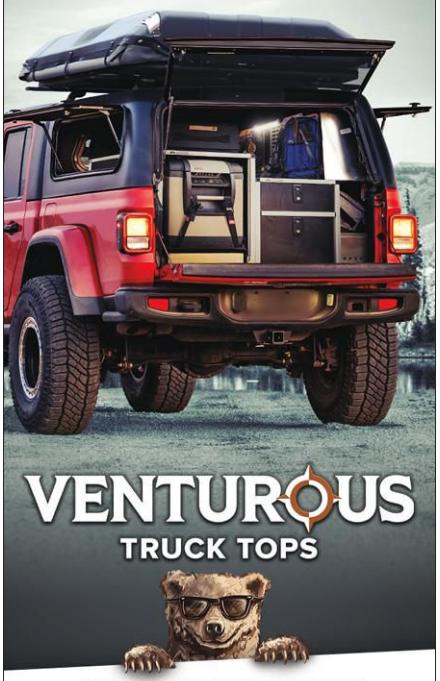
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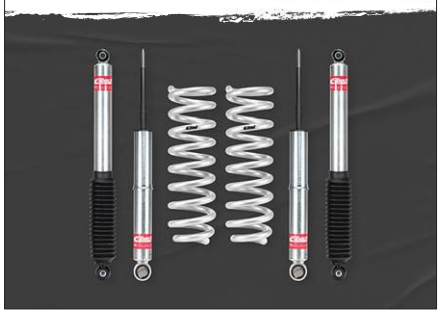
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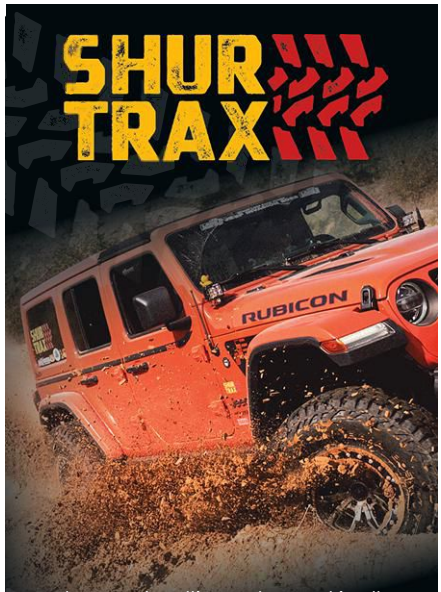
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Children's Book Celebrates Mechanic & Her Skunk



Book illustrations were handled by celebrated motorsports artist Roger Warrick.

Anita Millican was the first woman ever licensed as an IndyCar mechanic in 1980 and the first to go over the wall as a member of the pit crew. She did so as a jackman.

Anita, along with her husband, Howard, were also likely the first and only couple to raise a skunk at the racetrack.

They named the skunk Trouble, and the trio are celebrated in a new children's book, "The Trouble with Howard," written by racing veteran Lee Anne Patterson with illustrations by racing artist Roger Warrick.

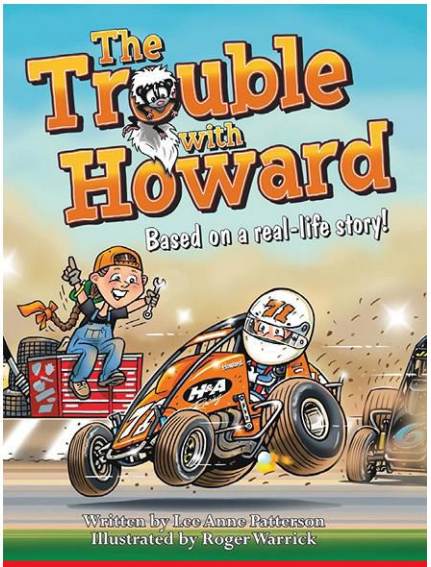
Howard and Anita Millican were innovative racers that were the first to cut an IndyCar in half and create a flowbench to study aero. They are also credited with inventing the shock dyno—literally sending shockwaves through the industry.

They have a storied history with Howard as a driver racing Sprint cars and wrenching together as mechanics and fabricators in IndyCar during what some might consider the most inventive era of the sport, working with many of the greats including Dan Gurney, A.J. Foyt and several members of the Unser family.

One day while headed to a race they rescued a baby skunk from the side of the road. Finding a baby doll bottle, they started feeding it and took it from race to race. As he grew, Trouble lived up to his name, digging in toolboxes, diving into coolers and making nests in awkward places.

The real-life story has been crafted into a new children's book by Patterson.

"The story not only celebrates ponytails in the pits but themes of sportsmanship, and scenes of life at the track are handled in authentic fashion," states a press release from Ground Effects Marketing. "Illustration on every page carries the energy you would expect from a racing book, with Warrick getting the details right. The race car looks like a real race car."



"The Trouble with Howard" is based on a real-life story of a racing couple that adopted a skunk.

The book also includes a brief bio about Howard, Anita and Trouble to inspire the next generation of racers.

Available in hardcover, the book is 44 pages and recommended for Grades 1 and up. Information as well as stickers, an official Trouble team shirt and a Trouble car air freshener "offering the sweet smell of victory" are available for purchase at thetroublewithhoward.com. **TS**



Anita and Howard Millican were innovative racers who left a mark on IndyCar.

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