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While maybe not as heralded as flashy components that add horsepower and torque, performance cooling products nonetheless play a vital role in keeping customers happy, whether at the cruise-in or racetrack or on the trail. *See article on page 16.* (Photo courtesy Mishimoto; inset photo courtesy SEMA)

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Jef White
Editor in Chief
theshopmag.com

Strong Sales Support Commercial Vehicle Opportunities

With a nationwide increase in delivery vehicles, maintenance trucks and related hardworking rides available and in need of upfitting and accessorization, a new study says now's a good time for aftermarket shops to consider offering fleet services.

Thanks to inventory level stabilization, the commercial vehicle ecosystem is showing signs of healthy alignment, according to the Q2 2025 Commercial Vehicle Market Analysis from Work Truck Solutions, as robust new vehicle sales are beginning to replenish used inventory and drive movement across both segments.

Over the summer, the report showed new vehicle pricing continued its gradual rise, with the average final price increasing by 0.4% quarter over quarter (QoQ) and 0.3% year over year (YoY) to $59,842. On-lot inventory per dealer dipped slightly from Q1 (down 0.6%) but remained significantly higher year over year (up 14.7%).

Sales activity picked up, with units moved per dealer rising 12.5% from Q1 and 35% year over year, reflecting operational demand, as well as a likely number of pull-ahead sales due to tariff concerns. Still, days to turn (DTT) rose again—up 17.4% from last quarter and 69.7% compared to Q2 2024—revealing slower commercial vehicle inventory turns despite higher sales as pockets of inventory remain mismatched to their market demand.

Meanwhile, used vehicle pricing continued to soften, falling 1.7% from Q1 and 2.9% year over year to an average final price of $34,456, according to the report. Used inventory per dealer remained nearly flat compared to the first quarter of the year after dipping in the final two quarters of 2024, while sales ticked upward by 4.5% QoQ and 10.5% YoY. Despite an anomalous uptick in Q1 2025, DTT, as expected, continued to decline overall, dropping 5.6% YoY.

"Although sales across most body types remain strong, the continued rise in new vehicle days to turn tells an important story," says Aaron Johnson, CEO of Work Truck Solutions. "While not a slowdown, there are more vehicles on the lot, more choices for buyers and more competition among commercial vehicle dealers."

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"For dealerships, this means the landscape is shifting," Johnson continues. "Success will hinge on how well they differentiate and adapt—whether through pricing strategies, inventory mix, digital merchandising or, more likely, a combination of all of these. The same tools that helped dealers thrive during leaner inventory times are at least as essential, if not more so, in an environment of increased competition. Visibility, agility and customer engagement aren't just advantages—they're requirements."

The report also shows median mileage of used commercial trucks and vans dropped 10.8% QoQ but is still up 5.1% YoY. The quarterly drop in mileage is likely a result of more businesses trading in fleet vehicles in general and doing so earlier than during the pandemic years, when on-lot inventories were dramatically impacted by supply challenges, according to study officials.

Of note, new commercial battery electric and hybrid vehicle (BEV/HEV) pricing saw a substantial uptick, with new prices rising 1.8% QoQ and 19.1% YoY to an average of $57,513. Conversely, used commercial vehicle prices in the segment fell 0.64% QoQ and 3.7% YoY.

Learn more at worktrucksolutions.com. ***TS***

THE SHOP

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2025 SEMA SHOW



From educational opportunities to parties & awards, see why it's billed as the world's leading automotive aftermarket event.

PHOTOS COURTESY SEMA

Billed as the world's leading automotive aftermarket event, the 2025 SEMA Show is set for Nov. 4-7 in Las Vegas. Bringing together the industry's most influential minds, innovative brands and trendsetting builders, the event features more than 2,000 exhibitors packed into the Las Vegas Convention Center.

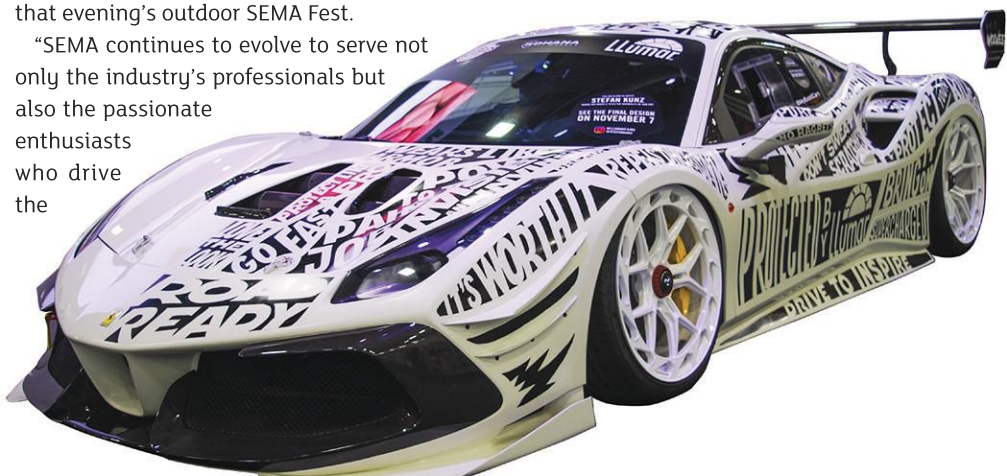
Highlighted by new products and inventive project vehicles, the show brings the aftermarket to life, from performance and racing to restyling, restoration, off-road and advanced technologies.

"For businesses navigating a rapidly changing market, the SEMA Show offers more than inspiration—it offers stability and an unmatched environment to future-proof your business," says Tom Gattuso, SEMA vice president of events. "In times of uncertainty, SEMA delivers clarity, confidence and opportunity, fueling connections that matter and growth that lasts."

Education seminars and networking functions throughout SEMA week provide attendees opportunities to learn from and connect with industry experts. The show will also continue its outreach efforts to enthusiast consumers with its Open to the Public program set for Friday, Nov. 7, and that evening's outdoor SEMA Fest.

"SEMA continues to evolve to serve not only the industry's professionals but also the passionate enthusiasts who drive the market forward," says Andy Tompkins, SEMA trade show director. "With expanded experiences like SEMA Fest and SEMA Show Friday – Open to the Public, we're creating access

The SEMA Show continues to evolve to serve not only industry professionals but also the passionate enthusiasts who drive the market forward. (Photo by Jef White)



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The fully reimagined SEMA Show education lineup includes free, expert-led training sessions as well as partnered learning programs.

for people to engage with automotive culture in meaningful and exciting ways and, in turn, building a growing enthusiast base that will help create a stronger industry."

AWARDS & COMPETITIONS

Highlights from the show include the annual SEMA Industry Awards, presented to individuals and companies that have made outstanding contributions to the automotive specialty equipment industry during the past year.

The program recognizes honorees in six different categories: Channel Partner of the Year, Content Creator of the Year, Gen-III Innovator of the Year, Manufacturer of the Year, Person of the Year and Visionary 8. A new award for Best Engineered Vehicle of the Year will also be unveiled.

"It takes hard work to grow an automotive specialty equipment business, and even more so to grow an entire industry," says Jose Escobar, SEMA manager of recognition programs. "Award nominees should exemplify outstanding professionalism and service that has propelled the industry forward."

Perhaps the event's best-known competition is the annual SEMA Battle of the Builders. Now in its 12th year, the program provides top vehicle customizers a chance to showcase their talents in front of a global audience.



Now in its 12th year, the Battle of the Builders competition provides top customizers a chance to showcase their talents in front of a global audience.

"It's inspiring to see SEMA Show builders continue to push the boundaries of automotive customization," said RJ de Vera, SEMA vice president of marketing. "We look forward to helping them grow and progress as we celebrate standout builds that highlight the ingenuity of our industry."

The 2025 SEMA Battle of the Builders Presented by Mother's Polish will recognize class champions in four categories—Hot Rod & Hot Rod Truck; 4-Wheel Drive & Off-Road; Sport Compact, Import Performance, Luxury & Exotic; and Young Guns—and one of the four class winners will be crowned the overall Battle of the Builders champion.

Industry experts serve as judges and review all qualifying applications, including vehicle descriptions and photos, before walking the show floor to review the builds in person and selecting the top 10 finalists in each category. The finalists are then narrowed down to the top three in each category, and those 12 finalists become the judges and select the winners of each category and overall champion.

"Some of the people we look up to the most in the industry have won this award, so to appear alongside those people is really incredible," says Noah Alexander, winner of the 2024 SEMA Battle of the Builders competition with his 1968 Dodge Charger. "The

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2025 SEMA HALL OF FAME INDUCTEES

The Specialty Equipment Market Association (SEMA) has announced the newest members of its hall of fame: Luanne Brown, George Lathouris, John McLeod and Larry Pacey.

"The automotive aftermarket industry has grown in remarkable ways thanks to the contributions of this year's hall of fame inductees," says Mike Spagnola, SEMA president and CEO. "Through their leadership and innovation, they not only changed the course of the industry's history but inspired and shaped the success of those around them."



LUANNE BROWN

Fueled by entrepreneurial drive and deep technical expertise, Brown founded eTool Developers in 2001, building proprietary platforms that filled critical gaps in website development and product data management. Brown served as a SEMA board member from 2008-15 and has held leadership positions in multiple SEMA communities, including SEMA Cares, the SEMA Businesswomen's Network (SBN) and as board liaison to the Automotive Restoration Market Organization (ARMO). She has been a long-standing and supportive SEMA PAC member over the years and is vice president of the Automotive Aftermarket Charitable Foundation (AACF).



GEORGE LATHOURIS

A 45-year industry veteran, Lathouris is well known for his personal and professional success that has been built on customer relationships and partnerships. From his first job at American Speed Equipment in the late 1970s to his last position as vice president at The Warn Group, Lathouris is recognized by peers for always putting the customer first. He was named the 2013 SEMA Person of the Year, served as SEMA Light Truck Accessories Alliance (LTAA; now the SEMA Truck & Off-Road Industry Alliance) chair from 2009-13, and is credited with driving considerable growth of the SEMA Pinewood Derby benefiting SEMA Cares charities.



JOHN MCLEOD

McLeod has been actively involved in the automotive and SEMA communities for over 23 years, starting from his earliest days working with Classic Instruments in custom automotive builds in the late 1990s, culminating with his acquisition of the company in 2001. Leading the SEMA Hot Rod Industry Alliance (HRIA), his Education Days and Builders Panel initiatives fostered a culture of continuous learning and knowledge sharing, as well as provided industry veterans an opportunity to pass on critical insights.



LARRY PACEY

Pacey's 55 years of industry experience began in 1969 when he opened National Carburetor Exchange in South Florida. Over a five-year period, the business evolved into a retail parts store handling many performance lines in addition to the carburetor line. His vision united many regional distributors under one larger, more sustainable umbrella, and today National Performance Warehouse (NPW) services more than 30,000 accounts in North America and several international markets. Pacey served on the SEMA board of directors from 1994-96.

best part for us was the incredible people we met. It was just amazing to talk to all of these other builders and hear what they do."



EDUCATION

Attendees at the 2025 SEMA Show will have several opportunities to develop new skills, connect with industry leaders and foster business strategies as part of this year's SEMA Education Program. The fully reimagined lineup of free, expert-led training sessions is designed to bring value and insight, complementing the high-energy learning environment experienced on the show floor, according to show officials.

"We invite all attendees and exhibitors to advance their professional and business growth during the show," says Gary Vigil, SEMA senior manager of professional development. "The SEMA Show has always provided learning and self-advancement opportunities through education, and this year we are offering free sessions within eight education tracks to address the key subjects that are influencing the aftermarket today."

The eight education tracks categorize sessions according to subject matter, allowing attendees to easily find programs that fit their professional interests:

1. ***Aftermarket Updates & Future Trends:*** Explore the current state of the specialty equipment market and the short- and long-term impacts of top trends.
2. ***Emerging & Executive Leadership:*** The Dale Carnegie Organization will illustrate how to listen and communicate with a workforce that encompasses different generations, and the SEMA Women's Leadership Symposium will empower leaders with the skills, mindset and strategies needed to drive exceptional performance.
3. ***Inside the Shop:*** Technicians, shop managers and builders will discuss trends and challenges that shop owners currently face.
4. ***Legislative & Regulatory:*** Learn about current changes and misconceptions in emissions compliance. Discover how to manage risks, ensure compliance and drive business success.
5. ***Sales & Marketing:*** Understand how to engage your audience using Instagram, YouTube and Facebook, and gain insights from top industry sales and marketing experts.

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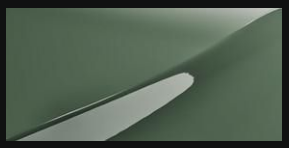


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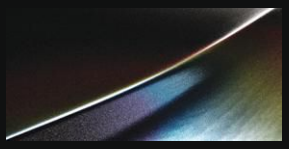
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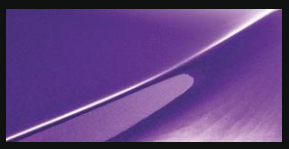
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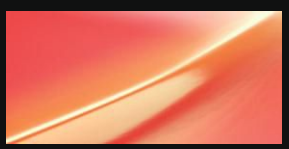
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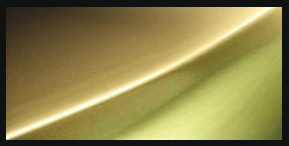
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Golden Aurora

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6. ***Small Business Strategy:*** Find hacks and tools to help grow your business. Learn how to leverage AI, use cloud computing and entrepreneurial operating systems (EOS), or run a functional family business while avoiding a feud.
7. ***Talent Management:*** Turn your team into a well-run machine by learning how to hire and retain young talent through training, management and motivation.
8. ***Vehicle Technology:*** Stay up to date on the latest changes in advanced fuels and powertrains, suspension technology and advanced driver-assistance systems (ADAS).

Partnered programs will also be available. Training sessions—both free and fee-based—from the Inter-Industry Conference on Auto Collision Repair (I-CAR), Tire Industry Association (TIA) and Society of Collision Repair Specialists (SCRS) will broaden the range of specialized courses offered at the 2025 SEMA Show:

- I-CAR will host courses on MIG welding, safety protocols for working on electric vehicles with high-voltage systems and modifying or repairing cars with ADAS functionalities.
- TIA will offer sessions that will help tire retailers protect themselves from liability, navigate the current employment market and retain talent.
- SCRS will show attendees how to put their business on a path of maximum efficiency, gain an online presence and identify incoming trends and technologies.

"The SEMA Education Program embodies our commitment to empowering the automotive community through knowledge, innovation and collaboration," says Tompkins. "With free, expert-led sessions tailored to every corner of the industry, this year's program is more dynamic than ever."

TECHS ROCK

In another collaboration, the TechForce Foundation, a national 501(c)(3) nonprofit committed to building a pipeline of skilled technicians, has partnered with the SEMA Show to present the seventh annual Techs Rock Awards. For the first time in the program's history, the awards will be presented live on stage at the 2025 SEMA Show in Las Vegas.

Each year, the Techs Rock Awards recognize standout students and working professionals in the technician field. Finalists will be selected in six categories: Automotive and Motorsports; Diesel; Collision; Restoration and Welding; Aviation, Motorcycle and Marine; and Evolving Technologies and HVAC; with winners recognized Nov. 5.

"Technicians don't just fix things—they keep America moving," says Jennifer Maher, CEO of TechForce Foundation. "The SEMA Show gives us a national platform to say, 'We see you. We value you.' And for the students preparing to join the workforce, it shows there is a future in this field that is respected and real."

This year's judging panel will include well-known voices in the industry, including ChrisFix, YouTube's most-followed automotive DIY creator, and Humble Mechanic, a trusted voice in technician education and culture.

"The SEMA Show is where the automotive aftermarket industry's future takes shape—through breakthrough products, new ideas and rising talent," says de Vera. "Technicians play a critical role in that future and with the TechForce Foundation, we're proud to spotlight and support those who will carry the torch forward."



SEMA FEST

When the show ends, the party begins.

Back for its third year, SEMA Fest 2025 has announced an all-star music lineup featuring Queens of the Stone Age, The Black Crowes and Neon Trees, along with high-performance automotive demonstrations, drifting, motorsports events, custom vehicles and more.

Held in the Bronze lot adjacent to the convention center, SEMA Fest has quickly become a bucket-list gathering for car lovers, providing an exclusive, behind-the-scenes look at the trends, builds and innovations driving the automotive aftermarket.

As mentioned, enthusiasts are welcome to attend the SEMA Show Friday – Open to the Public program and that evening's SEMA Fest.

"SEMA Fest brings the excitement of car culture and live music together like never before," says Gattuso. "When combined with the rare opportunity to walk the SEMA Show floor during Friday's public access, it creates an unforgettable experience for enthusiasts. It's the ultimate way to celebrate the industry, the community and everything that makes car culture so special."

Some of those members of the public may also choose to enjoy the benefits provided by the newly announced SEMA+.

Building on the launch of SEMA's Individual Membership in 2021, the rebranded SEMA+ membership is designed to deliver greater value to enthusiasts, consumers and the industry community, officials note. Members can save money on aftermarket parts, gear and services, spotlight their ride on SEMA social media, save money on tickets to select automotive events throughout the year, and stay updated on industry and advocacy news through a dedicated newsletter—bridging the gap between their automotive passion and the


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Held in the Bronze lot adjacent to the convention center, SEMA Fest has quickly become a bucket-list event for car lovers, providing an exclusive, behind-the-scenes look at the trends, builds and innovations driving the automotive aftermarket.

aftermarket community, events and brands they enjoy.

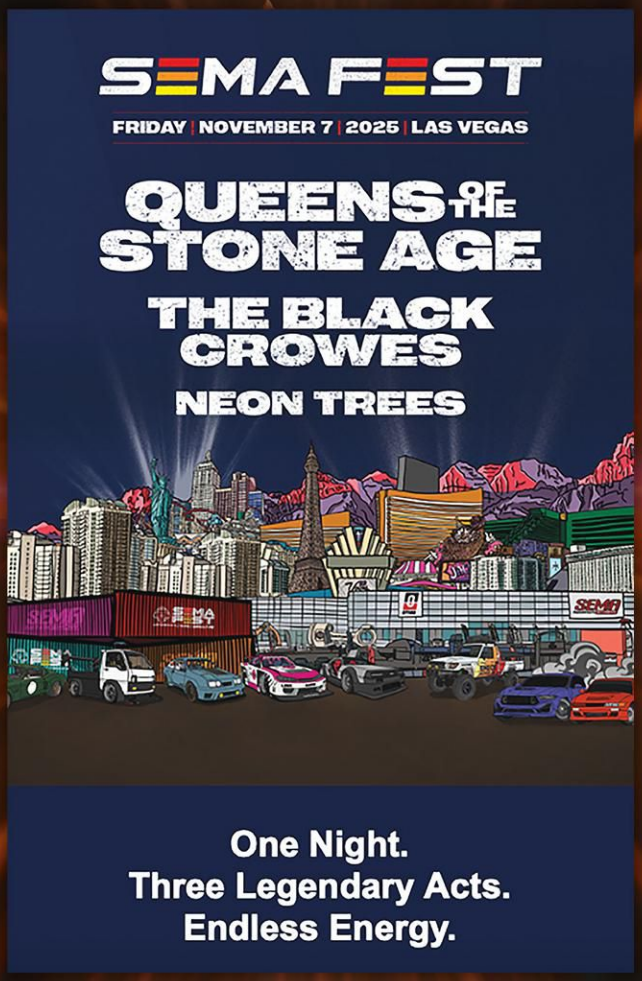
"The reimagined SEMA+ program is more than a membership; it's a movement to unite the industry and amplify its collective voice," says AJ Carney, SEMA senior director of membership. "With exciting new brand partnerships and updated programs and experiences, we aim to strengthen our foundation and further preserve, protect and grow the automotive aftermarket industry in new and exciting ways."

MOVING FORWARD

Finally, in July, officials from the Specialty Equipment Market Association (SEMA) released a statement noting that a forthcoming law in Nevada pertaining to local enforcement of state and federal vehicle emissions laws will not affect the show.

On June 10, Nevada Gov. Joe Lombardo signed SB 80 into law. The legislation provides a new framework for local law enforcement, in tandem with existing inspection authority, to punish bad actors who are breaking existing state and federal emissions laws, establishing new penalties for illegal behavior.

"SEMA has always been aware of Nevada's SB 80 and provided feedback on the bill on behalf of the automotive community as it was developed. SB 80 is common-sense legislation that maintains the status quo as it pertains to existing state and federal law. SEMA was, and is, comfortable with this bill, which reinforces existing state and federal bans on emissions system tampering. The law is still the law as it pertains to emissions systems," the association states. *TS*



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BEATING THE HEAT

Performance cooling keeps projects operating at peak efficiency

BY JEF WHITE

What heats up must cool down—when it comes to classic, specialty and racing vehicles, at least.

While maybe not as heralded as flashy components that add horsepower and torque, performance cooling products nonetheless play a vital role in keeping customers happy, whether at the cruise-in or racetrack or on the trail.

From adding quality fans and radiators to installing complete cooling solutions, shops can find success by helping drivers beat the heat. Top suppliers are ready to help with introductions to their latest cooling products, observations on market trends and recommended sales strategies to keep specialty vehicles operating at peak efficiency.

COOLING SYSTEM SUCCESS

Whether on the street or off-road, modern specialty vehicles are more powerful than ever, forcing quality aftermarket cooling product upgrades to keep pace.

"As horsepower expectations continue to climb, proper cooling becomes more critical than ever, which means more opportunities for shops," says Steve Beebe, marketing director for Griffin Thermal Products (Griffin Radiator). "Today's customers want complete solutions, not just parts. Offering well-designed, high-quality cooling systems positions shops as knowledgeable, trustworthy partners. Plus, the built-in upsell potential makes it a win for the bottom line."

The good news about selling and installing performance cooling products is that most every customer can benefit from an upgrade.

"You aren't having to convince the customer that they need this segment of the industry," says Cole Quinnell, marketing manager for Flex-A-Lite. "Their vehicles need

Along with performance gains, improving cooling system efficiency reduces wear and tear on vital parts. (Photo courtesy Mishimoto)

MISHIMOTO

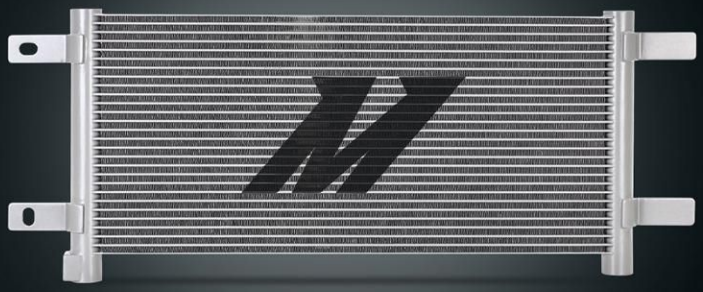
AUTO | TRUCK | DIESEL | JEEP

At Mishimoto, we engineer advanced performance cooling solutions to keep your engine and transmission running stronger, longer, and cooler under pressure.



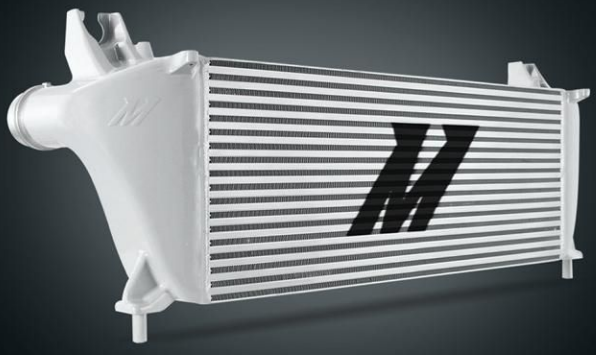
ALUMINUM
RADIATORS & HOSES

> Direct-fit and universal applications available
> Increased core volume for maximum cooling efficiency
> Tig-welded aluminum construction
> Extensive line of silicone hoses and clamps complete the setup



PERFORMANCE
TRANSMISSION COOLERS

> Lower temps means less stress on your transmission
> Compatible w/ OEM and other Mishimoto products
> Includes everything needed for installation



PERFORMANCE
INTERCOOLERS

> Direct-fit and universal applications available
> Reduces air intake temps for more power
> Tough aluminum construction to withstand high boost pressure

THE WORLD LEADER IN PERFORMANCE COOLING PRODUCTS®

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NOW ACCEPTING
DEALERS

DESIGNED, ENGINEERED, AND TESTED IN THE USA

ALL MISHIMOTO PRODUCTS CARRY A
LIFETIME WARRANTY + ACCIDENT PROTECTION

PERFORMANCE COOLING PRODUCTS

HOT PRODUCTS: Remote Fluid Coolers
FEATURES & BENEFITS: Consistent cooling that can be mounted anywhere on the vehicle; multiple core styles available that allow for all ranges of cooling needs; sealed motor fans that are protected from water, dirt and road debris.

Derale Performance
Cam Brandt
Performance Division Manager

HOT PRODUCT: Flex-Wave Electric Fan
FEATURES & BENEFITS: Auxiliary fan comes in 12-, 14- and 16-inch diameters; patented fan blade design that moves up to 25% more airflow; quiet operation; ultra-slim LoBoy models measure just 3-3/8-inches thick at the motor; all our electric fans are built in the USA.

Flex-A-Lite
Cole Quinnell
Marketing Manager

HOT PRODUCT: CU-70013-LS ComboUnit
FEATURES & BENEFITS: Tailor-made for the Chevy C10 market; includes a high-performance Griffin PerformanceFit radiator, integrated automatic transmission cooler, laser-cut aluminum shroud, twin SPAL fans, plug-and-play wiring harness, temperature sensor and cap.

Griffin Thermal Products (Griffin Radiator)
Steve Beebe
Marketing Director

HOT PRODUCTS: Smart Start Fans
FEATURES & BENEFITS: Unique, hybrid technology; provides features of brushless BLDC fans without the high cost; soft start minimizes amperage draw at startup and limits transient voltage between fan and alternator; quiet sickle blade design produces improved airflow.

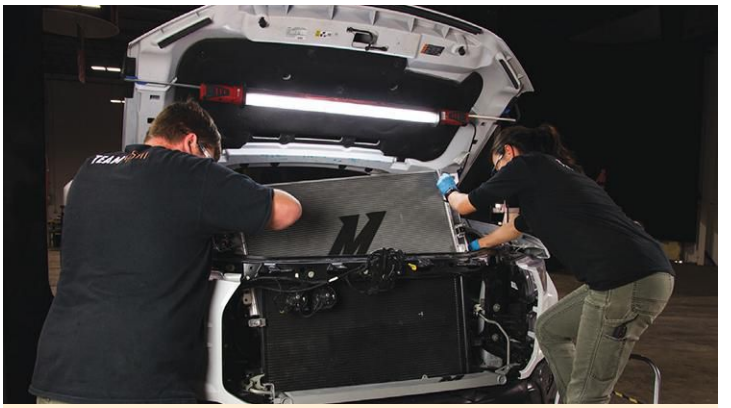
Maradyne High Performance Fans
Jim Kahl
Product Manager

HOT PRODUCT: Performance Aluminum Radiator
FEATURES & BENEFITS: Direct-fit upgrade that installs with no cutting or drilling; multiple tube and fin configurations; application-specific radiator core tailored for optimal fitment and cooling performance; built from TIG-welded aluminum; transmission coolers also available.

Mishimoto Automotive
Chris McKendry
Marketing Manager

HOT PRODUCTS: Performance Cooling Systems
FEATURES & BENEFITS: Purpose-built solutions for supercharged LS, LT, Coyote and Hemi engine swaps; systems include a high-performance radiator, aluminum shroud, SPAL brushless fans, A/C condenser, air-over-water intercooler, expansion tank and intercooler reservoir.

Wizard Cooling
Scott Attig
President



Consider complementary parts to maximize the cooling system's overall performance. (Photo courtesy Mishimoto)

some sort of cooling, and if they have overheating problems, the customer is usually frustrated and willing to go to any length to solve it."

If clients are willing to spend on horsepower and performance upgrades, it makes sense to improve the cooling system as well to protect their investment.

"Cooling components are crucial to the health and longevity of the engine, transmission and other key components. In addition to outright performance gains, improving the efficiency of the cooling system will allow the customer to get more done with less wear and tear on vital parts," says Chris McKendry, marketing manager for Mishimoto Automotive. "Whether it's beefing up their truck's transmission cooler for towing heavy loads, keeping water and oil temps down while pushing on track, or reducing a turbocharged engine's intake air temps for some extra horsepower, there's no shortage of temps to regulate."

Although cooling isn't particularly "glamorous," notes Jim Kahl, product manager for Maradyne High Performance Fans, it's vitally important.

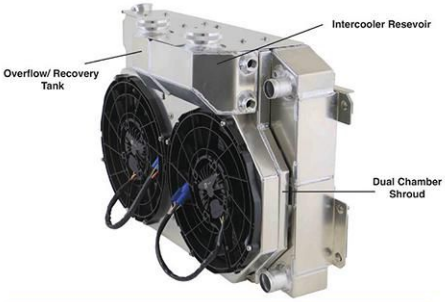
"No matter how big, bad and fast your engine is, if you can't keep it





While proven solutions have some flexibility, successful installers avoid adopting a one-size-fits-all approach. (Photos courtesy Derale Performance)





Help drivers understand how each component of the cooling system works and how they work together. (Photos courtesy Wizard Cooling)

running cool you are in trouble," he says. "Selecting and installing the right cooling fan for your build or modification can make all the difference in the world when it comes to either having a great day at the cruise or on the track or being overheated on the side of the road."

Shops can find success addressing the entire cooling system as a single unit, says Scott Attig, president of Wizard Cooling, which offers packages that include the radiator, shroud, brushless fans, A/C condenser, air-over-water intercooler, expansion tank and intercooler reservoir.

"Every system is engineered for serious performance, with multiple core options available based on heat load, and we support both manual and automatic transmission setups. This allows us to put a system together that is tailored to your specific build," he says. "It's not just about performance—it's about giving shops and builders a system that saves time, looks great and scales with the vehicle's needs."

Once a shop masters creating successful cooling systems, it can then adapt them to work in different builds, notes Cam Brandt, performance division manager for Derale Performance.

"There is a wide variety of diversity in terms of upgrades that can be utilized in





HOW ABOUT AN A/C RECHARGE?

When it comes time to consider add-on sales suggestions for your performance cooling projects, don't forget one often-overlooked aspect—the driver.

Orbia Fluor & Energy Materials offers a direct replacement for R-1234yf air conditioning refrigerant that company officials say delivers a faster cooldown using less energy. Klea Edge R-444A has been shown to improve engine performance and fuel economy and can extend battery life in EV vehicles.

"This product cools the A/C down faster, which is important—especially in hot climates," says Chuck Abbott, global marketing manager.

Shops that are not yet servicing R-1234yf vehicles can instead choose to retrofit with next-gen Klea Edge R-444A.

"The equipment investment can be significantly less, and doing so can provide a higher value of service to your customers," Abbott notes.



Klea Edge R-444A is a direct replacement for R-1234yf air conditioning refrigerant that delivers a faster cooldown. (Photo courtesy Orbia Fluor & Energy Materials)







Most every customer can benefit from a performance cooling system upgrade. (Photos courtesy Flex-A-Lite)

multiple systems to work with all critical systems on a vehicle," he says.

WORKING TOGETHER

Understanding both the cooling products themselves and the planned use of the vehicle will help professionals provide unique solutions that work for each application.

"Shops need to know their customer's cooling requirements and provide the proper fan to meet their needs," Kahl suggests. "For example, out on the road, larger and faster fans are not always better. At higher speeds, natural airflow (RAM air) across the radiator is usually sufficient to keep the engine cool. An overly fast fan can disrupt the airflow and potentially hinder this RAM air and heat dissipation. Properly sized, placed and controlled electric fans are most effective."

While proven solutions can be copied and adapted to different vehicle types and usage plans, Brandt cautions against a simple one-size-fits-all approach.

"Each application is unique in terms of what may be limiting the performance of even upgraded parts and has to be carefully considered to make sure all needs are met," he explains.

Attig says that it's sometimes difficult to judge the performance of available cooling products, noting that not all aluminum radiators are "high-performance," for example, and not all fans move air at the same rate.

"It's not just about individual components," he says. "It's about how all the pieces work together as a system."

Quinnell agrees, noting that quality parts deliver noticeable improvements.

"The quality of the (fan) motor makes a big difference in performance and durability. Engineering has a significant impact on efficiency (amp draw/cfm of airflow) as well as airflow under load. As with most things, you get what you pay for," he says. "That extra-cheap, 14-inch fan on Amazon isn't going to perform or last nearly as long as a quality fan from an established performance cooling company. As a shop, customer satisfaction and comebacks have a huge impact on your bottom line."

Beebe also cautions shops against assuming all parts are created equal.

"Too often, we see high-end builds compromised by inexpensive, imported radiators that simply can't hold up. Quality matters," he says. "Real performance radiators should be made from 3003 aluminum, fully brazed, TIG-welded and pressure-tested to ensure long-term durability. When shops understand and communicate that difference, they protect both their customer and their reputation."

Once established, professionals can begin building relationships that keep cooling components top-of-mind with customers.

"A common misconception is that a radiator is a once-and-done upgrade," says McKendry. "The aluminum radiator, while certainly better than stock, is only as good



As horsepower expectations continue to climb, proper cooling becomes more critical than ever. (Photos courtesy Griffin Thermal Products)

as its surroundings. It's important to consider complementary parts to maximize the system's performance."

FREEDOM OF CHOICE

Cooling system sales are often a high priority for buyers once they understand the true performance upgrades they'll experience.

"Remember that cooling is something that can rarely be overdone and will lead to the engine, transmission and even a power steering pump lasting longer," says Brandt



MOTORSPORTS BRINGS $69.2 BILLION TO US ECONOMY

Motorsports brings more than $69.2 billion in annual economic impact to the American economy and supports more than 318,000 American jobs, according to a study released in June by Performance Racing Industry (PRI).

Researchers evaluated the economic contributions from multiple racing businesses, including tracks and promoters, parts manufacturers, distributors, retailers, service providers and incorporated race teams.

Key findings from the study include:

- American workers in the motorsports industry earn more than $22.1 billion worth of wages and benefits.
- The industry generates more than $8.2 billion in tax revenue, including $5 billion in federal taxes and $3.2 billion in state and local taxes.

"Racing holds a special place in American life, and this milestone report highlights the broad scope of the motorsports industry as an economic driver at the local, state and federal levels," says Michael Good, PRI president. "Using these results as a foundation, PRI will continue to seek ways to foster the motorsports industry, from racetracks to manufacturers, and from small businesses to major national employers, to ensure motorsports continues to touch every part of the country and bring together people from all walks of life for competition and community."



The new Formula GT series exemplifies the overall health of the racing market. (Photo courtesy Formula GT, inset graphic courtesy PRI)



Selecting and installing the right cooling fan for each build is vital. (Photos courtesy Maradyne High Performance Fans)

from Derale Performance. "Customers spend a lot of money to set up their vehicle exactly how they want it, and our job is to keep them happy with that investment. While they may not want the initial cost of the part, if they don't have to make major repairs as often then proper cooling is going to be the ultimate insurance."

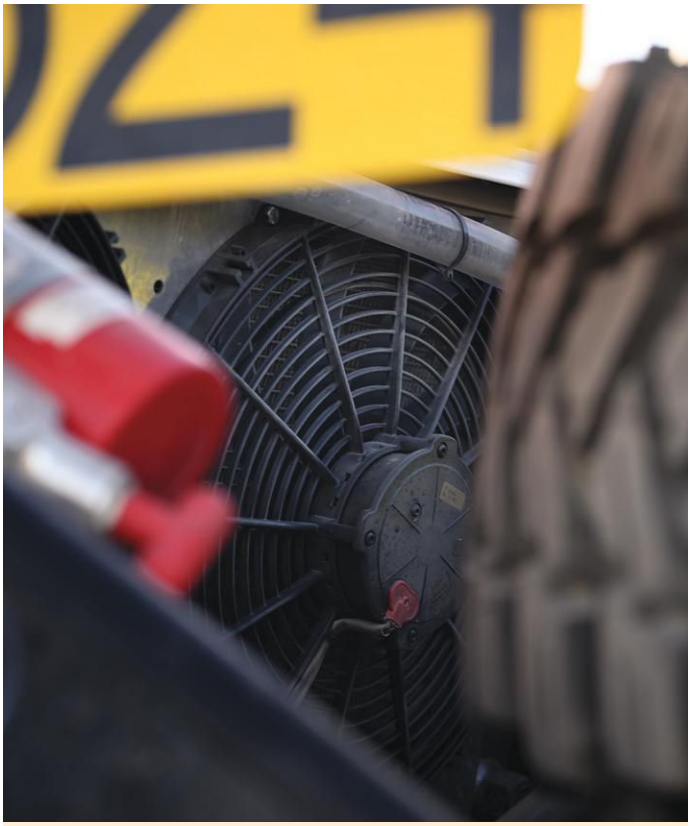
Attig from Wizard Cooling believes the keys to a successful transaction are helping drivers understand how each component of the cooling system works and how they work together.

"One of the best strategies we've found is to always present the customer with two or three well-explained options. When you can explain the differences clearly—pros, cons, performance trade-offs—it builds trust and leads to better outcomes for both the shop and the customer," he says.

That education can come in the form of showroom displays that show the noticeable advantages quality products deliver, says Quinnell.

"Buy a cheap fan and a Flex-A-Lite Flex-Wave LoBoy to keep in the shop to connect to 12-volt sources for demonstration purposes. The airflow between these two prod-





No matter how big, bad and fast your engine is, if you can't keep it running cool, you're in trouble. (Photo courtesy Maradyne High Performance Fans)

ucts that are supposedly the same will be obvious," he suggests. "The customer will also be able to hear the difference—a cheap fan will make a lot of noise, which will also be undesirable."

When it comes to a sales strategy, Mishimoto's McKendry has a simple recommendation.

"Bundle, bundle, bundle. There are so many complementary parts that can (and should) be installed together that it makes the upsell process easier, logical and worthwhile to the end consumer," he says. "Replacing a radiator? A silicone hose kit is a perfect upgrade to replace dried or cracking OEM hoses, and a fresh set of clamps is also a great idea. Our fan shroud kits, thermostats, clamps and liquid chill coolant all are designed to work seamlessly with one another as a one-stop shop."

Noting his company offers combination cooling solutions, Beebe from Griffin suggests an opening line of "What are you doing for fans?"

"It opens the door to a complete cooling solution that means a big difference in value for the customer and revenue for the shop," he says. "Everything comes ready to go—fans, shroud, wiring and sensor. It's a plug-and-play upgrade that makes everyone's job easier."

Maradyne's Kahl agrees that shops should seek out worthwhile partnerships with quality suppliers to stay on top of the market and deliver an enjoyable experience for end users.

"We add a personal touch to every product that we sell," he notes. "Making our customer's lives easier makes them want to do business with us. Providing this extra, personal touch is guaranteed to help any shop do the same and increase their sales." ***TS***





Offering quality parts gives customers peace of mind. (Photos courtesy RANDYS Worldwide)

Gaining TRACTION

Upsell opportunities abound in the performance drivetrain market.

BY JOHN CAROLLO



The engine, transmission and rear end aren't officially known as the "big three" of any vehicle, but maybe they should be. After all, they are creating power, shifting gears and turning wheels to get and keep things moving.

From the racetrack to the street to the trail, all specialty vehicles have the same goal—get the power to the ground. With that in mind, it's easy for shops selling and installing performance drivetrain components to make a case for treating these systems as integral parts of the driving experience.

Performance drivetrain product suppliers are here to offer insights on the common misconceptions and unexpected benefits shops may encounter in this market, plus sales strategies and new product descriptions to help your customers gain traction.

OPTIONS & UPSELLS

Many drivers direct their focus solely under the hood when searching for horsepower gains. Industry professionals know that an upgraded drivetrain setup is just as essential to overall performance.

"Shops that understand that the drivetrain of a car is equally as important as the engine build are ahead of the game," says Krista Baldwin, director of marketing for FTI Performance. "When a customer wants that high-horsepower street or track car, a lot of the time they don't think of the drivetrain. Once a shop explains that the drivetrain is a vital part of the car build, then the customer will be very happy they picked the correct drivetrain to handle the amount of horsepower for their vehicle, and they should have no issues on or off the track."

Enthusiasts often turn to shops for advice and installation recommendations because, when it comes to the drivetrain market, there are plenty of choices to be made.

"Options and upsells are a benefit when someone is upgrading their driveline," says J.C. Cascio, director of business development for Strange Engineering. "Some of the driveline upgrades are labor-intensive, which make it a 'convenient time' to upgrade related parts. An example would be changing a gear or differential. The entire rear needs to come apart to service the gear and/or posi (limited slip). Upgrades like axles, bearings, brakes, etc., would all be sensible options for someone to save some labor costs."

In some instances, choices are handled through preselected component kits.

"Beyond technical precision and dependable performance, an underappreciated benefit of selling and installing Yukon Gear Kits

is how much shop time they save—techs can avoid sourcing multiple parts, reduce lift time and minimize customer wait times," says Jonathan Brower, national accounts director. "This efficiency not only boosts throughput but also strengthens your shop's reputation for professionalism. Plus, offering quality parts gives customers peace of mind and reinforces repeat business and word-of-mouth referrals."

And, if a shop ultimately needs help with its choices, suppliers are ready with recommended solutions.

"When working with Auburn Gear, shops that install our products have direct access to technical support from the factory," says Conner Hoagland, aftermarket business unit manager.



Partnerships with quality suppliers help build successful drivetrain projects. (Photos courtesy Auburn Gear)

GOOD TO KNOW

Suppliers look to set the record straight about the common misconceptions they run into when serving the performance drivetrain market.

"When choosing an FTI converter, a common misconception is that you choose a converter based on just the advertised stall number," says Baldwin. "But the converter is determined by average car weight, gear, ratio and more. Our customer service team is available to lead the customer when choosing the correct converter based on their vehicle."

For Brower, a common misconception is



PERFORMANCE DRIVETRAIN PRODUCTS

■ **HOT PRODUCT:**
Grip-N-Loc Limited-Slip Differential
■ **FEATURES & BENEFITS:**
Popular for GM 8.5-inch center sections; coned clutches reduce chatter at slow speeds and increase torque five-times greater than OEM differentials.

Auburn Gear
Conner Hoagland
Aftermarket Business Unit Manager

■ **HOT PRODUCTS:**
10R80 Torque Converters
■ **FEATURES & BENEFITS:**
CAD-designed, CNC-machined and equipped with billet stators; custom stall configurations create a single-disc lock-up converter suited for the street and track; TIG-welded by hand.

FTI Performance
Krista Baldwin
Director of Marketing

■ **HOT PRODUCTS:**
Yukon Gear Kits (YGK Series)
■ **FEATURES & BENEFITS:**
Comprehensive re-gear packages that include both front and rear ring-and-pinion gear sets plus a full Master Overhaul Kit bundled under one part number; span a range of gear ratios and applications to suit everything from lifted trucks to trail-proven Jeeps.

RANDYS Worldwide
Jonathan Brower
National Accounts Director

■ **HOT PRODUCTS:**
Complete Rear End Assemblies
■ **FEATURES & BENEFITS:**
Turnkey assembly bolts in with no worries of mismatched components or compatibility issues; popular offerings include the Strange S-Trac differential and 35-spline alloy axles; other race options include 9-inch aluminum cases, gun-drilled axles and more.

Strange Engineering
J.C. Cascio
Director of Business Development



Shops that understand that the drivetrain of a car is equally as important as the engine build are ahead of the game. (Photo courtesy FTI Performance)

the belief that installing gear sets piecemeal or using generic kits is as reliable—and/or faster—than using a complete, application-matched kit.

"In reality, blending unmatched components often leads to setup issues, wrong parts or premature failure," he reveals. "Emphasizing that YGK kits are accurate and rigorously validated for both fit and finish helps shops avoid these costly—or even dangerous—mistakes."

For Cascio, confusion can sometimes come in the form of different applications.

"Driveline products, like axles, use different materials and heat treatments to accommodate different applications. The misconception is that 'race' products are better/stronger and, therefore, better for street cars," he reveals. "For example, Strange's Hy-Tuf line of axles are through-hardened, which improves the torsional strength of the shaft, which is great for drag race applications. The Alloy line of axles is induction-hardened, which allows the axles to flex to handle road conditions like speed bumps, railroad tracks and potholes. In a time where 'drag-and-drive' is gaining popularity, it is important to find the right combination for each project."

Hoagland, meanwhile, battles against expected inventory.

"High-volume units are kept in stock; low volume is build-to-order," he explains.

MAXIMUM RESULTS

For maximized sales of drivetrain products, Auburn's Hoagland recommends first considering the benefits of working with quality suppliers.



Consider options and upsells when installing drivetrain components. (Photo courtesy Strange Engineering)



Educate customers on the benefits of better traction, increased towing capacity and proper gear ratios for upgraded tires or rugged terrain. (Photo courtesy RANDYS Worldwide)

"We have found that MAP pricing is essential for helping our distributors stay competitive in the market," he says.

Those benefits can also come in the form of a customer service line, says Baldwin from FTI Performance.

"We have a whole team of technicians who live and breathe converters and automatic transmissions. Don't chance a customer's build with a poor decision for the drivetrain. We are here to help you and help the customer have a kick-ass car and build something that you both will be proud of."

Prepackaged kits save time and resources while instilling confidence in buyers, notes Brower from RANDYS.

"Position Yukon Gear Kits not just as drivetrain components, but as complete solutions—highlight how they streamline installs with one part number and avoid downtime associated with missing or mismatched parts," he suggests. "Educate your customers on the expanded benefits of better traction, increased towing capacity and ideal gear ratios for upgraded tires or rugged terrain. Then, couple that with efficient installation workflows and clear itemized quotes to help customers appreciate the value and confidently invest."

The ultimate goal is to offer solutions that can seamlessly handle today's big-power projects.

"Horsepower and torque numbers have increased tremendously over the past few decades. The drivelines supplied from the factory are not capable of handling the numbers that a motor produces with a simple bolt-on supercharger, turbo or nitrous kit," says Cascio from Strange Engineering. "If someone is investing into their engine program, it only makes sense to build a performance driveline that will handle the power and avoid potential catastrophic failures in the future." **TS**





AI can help speed shops work more efficiently and effectively. (AI photo credit: adel - stock.adobe.com)

How AI Can Benefit Your Social Media Marketing

Speed shops can use artificial intelligence to generate creative & streamline the advertising process.

BY STEVE BUORS

Steve Buors is the co-founder and CEO of Reshift Media, an award-winning franchise marketing firm. Learn more at reshiftmedia.com.

Artificial intelligence (AI) is reshaping all aspects of businesses across every industry, and digital marketing is no exception. By generating creative, targeting the right audience at the right time and streamlining the advertising process, AI can help speed shops and other aftermarket businesses work more efficiently and effectively.

However, with great power comes great responsibility, and using AI responsibly and ethically is crucial to building trust, staying compliant and standing out in a competitive market.

THE RISE OF AI IN DIGITAL MARKETING

AI is quickly becoming an everyday part of digital marketing. Across many industries, businesses are using it to brainstorm ad hooks, refine copy and messaging, design graphics and videos and improve campaign performance. In retail, real estate and even health care, AI is helping companies connect with people more effectively. Now, performance shops are joining in, too.

For auto aftermarket businesses, AI can be especially helpful. Whether you're promoting tire sales, oil change packages or engine swap specials, AI can help you get your message in front of the right people at the right time, without spending a lot of time and creative resources.

COMMON AI AD TOOLS

There are plenty of tools available that make it easier for busy shop owners and marketers to run smart, effective social ads. Some are built right into the ad platforms you may already be using, and others are add-ons that support your content or website.

Here are some useful tools to try adding to your marketing stack:

Mainstream Social Media Advertising AI Tools

- ***Meta Advantage+ Creative***: Meta's advertising suite now includes a variety of AI tools to help you test different versions of your ad (images, headlines, audiences, etc.) and automatically shows the best-performing combinations, as well as generate image variations based on your source photos. When creating ads, there is a new "branding" section that allows you to identify your business's default logos, colors and fonts to help Meta better represent your brand in its AI-generated images and text.
- ***Google Performance Max:*** This campaign type uses AI and machine learning to place your ads across Google's entire network, including YouTube, Search, Gmail and Maps, based on what's most

likely to get you the best results.

- ***Content Tools:*** Programs like Canva, ChatGPT and Jasper can help you write post captions, create and edit visuals, find useful hashtags, analyze which creatives are performing best and tackle many other tasks.

Auto-Specific AI Tools

- ***Car Studio:*** Designed for car dealers and service shops, this tool uses AI to make professional-looking vehicle images for social posts and ads.
- ***Auto Listings Plug-in for WordPress:*** Automatically displays vehicle inventory on a website with search features.
- ***WP Auto Listings:*** A more advanced WordPress plug-in with extra listing tools and customization for dealerships and parts sellers.

BEST PRACTICES FOR AI-ASSISTED SOCIAL MEDIA

AI & Content Creation

AI is changing the way businesses plan and create content. For content planning, AI tools can help you better understand your audience members, what they care about and when they're most active, and which topics are trending.

These tools can also suggest new content ideas by analyzing keywords, competitor activity, online reviews and performance trends, keeping your business content relevant and consistent.

AI helps with personalization by recommending content based on how people interact with your brand. This means you can create posts or ads that feel more tailored to the reader, often leading to better engagement. Some tools can even predict which types of content (videos, plain text, images, etc.) are likely to perform best among your customers.

When it comes to content creation, AI can assist in creating written content, including captions, ad copy, blog drafts and more. While it's not a full replacement for human writing, it can speed up brainstorming and give you a strong starting point.

The same goes for visuals; as AI becomes more advanced, tools can help generate and edit images, suggest video ideas and hooks, and even create professional-looking videos and animations using tools like Google's VEO 3.







These tools often still need a human touch to create the final product, but they make the overall process much more efficient and are continually improving their output.

AI & Targeted Advertising

Instead of relying on general audience categories and personas, AI can analyze your customer data like user behavior, past interactions, purchase history and content engagement to create much more detailed audience segments.

This means you can target specific groups based on what they're actually looking for and not just their age, location and general interests. For example, if someone has recently shown interest in brake upgrades or seasonal tire changes, AI can help you serve them a tailored ad promoting those services.

AI & Performance Analytics

Measuring how your ads are performing is key to running a successful campaign, and AI-powered analytics tools can make that process easier and faster.

Social advertising analytic tools like Motion and MagicBrief can track important metrics like clicks, conversions, cost per acquisition, engagement and creative performance. They give you real-time data so you can see what's working and where there's room for improvement in your campaigns and social creative.

AI can help you get your message in front of the right people at the right time, without spending a lot of time or creative resources. (AI Photo credit: fadi - stock.adobe.com)

What makes AI even more helpful is that, alongside the numbers it's reporting, it can give suggestions on what can be improved. If an ad isn't doing well, AI can recommend



changes like adjusting your audience targeting or updating your video's hook or angle. Over time, AI can also spot trends and highlight which campaigns are giving you the best return on investment.

USING AI RESPONSIBLY

While AI can make social media more efficient, it also raises important ethical questions. Using AI the right way isn't just about getting good results; it's also about protecting your customers and your brand.

Here are a few key things to keep in mind:

- ***Data privacy:*** If you're collecting information through forms, website cookies or other means, make sure you're following state and country privacy regulations like California's Consumer Privacy Act, GDPR and Canada's Privacy Act, depending on where your advertising is targeting. It's important to treat your customers' data responsibly and let people know how their information is being used.
- ***Bias mitigation:*** AI tools learn from patterns in data, but sometimes those patterns aren't fair. Additionally, biases can be found in the data AI is pulling from, having a potential impact on the accuracy of the content it generates.
- ***Avoiding misinformation:*** AI-generated content can sound truthful, but it's not always accurate. Always double-check your content to make sure all claims are correct, especially when it comes to pricing, specifications, features or service claims.
- ***Transparency:*** If you're using AI tools to respond to messages or create social media posts or ads, be honest about it. Customers appreciate honesty, and it helps build long-term trust. Also, be aware that some social platforms like Meta may automatically add a label to AI-generated ads.



There are plenty of tools available that make it easier for busy shop owners to run smart, effective social ads. (Photo credit: GamePixel - stock.adobe.com)

THE FUTURE OF AUTO-RELATED AI

AI is evolving quickly, and it's likely to play a bigger role in auto-related marketing over the next few years. To stay competitive, auto aftermarket businesses should adopt a mindset of "test, learn and adapt."

You don't need to become a tech expert overnight, but being open to using AI tools thoughtfully and ethically is the key to future-proofing your marketing. ***TS***



PERFORMANCE PRODUCTS

Stock Your Shelves With These Go-Fast Components



Synthetic ATV/UTV Continuously Variable Transmission Fluid

AMSOIL, Superior, Wisconsin, presents its 100% Synthetic ATV/UTV Continuously Variable Transmission (CVT) Fluid. Designed to deliver optimum performance and protection in Polaris STEELDRIVE CVTs, the fluid is built with a high film strength that resists extreme pressure to combat metal-on-metal friction that can increase heat and wear during heavily loaded, high-temperature operation.



Low-Profile Magnetic Drill

Blair Equipment Company, Swartz Creek, Michigan, presents the BFD-KX+ Right Angle Magnetic Drill. Engineered to meet the needs of industry professionals requiring power, precision and accessibility in tight workspaces, the system provides maximum drilling capability while maintaining a compact form factor. Small-batch built in the USA, it includes a high-torque motor and uses Karbon X+ annular cutters. A strong magnetic base provides secure adhesion for steady drilling operations, increasing precision and safety.

C10 Big Brake Kits

Wilwood, Camarillo, California, presents its new Big Brake Kits for 1963-87 Chevy C10 models. Utilizing Tactical Xtreme TX6R calipers and 16-inch rotors designed to work with the company's ProSpindle to provide added stopping power, the kits enhance braking performance. Features include stress-flow forged aluminum 6-piston calipers and military-grade Spec37 iron alloy rotors with 60 internal curved vanes that provide increased brake torque and thermal capacity and are available in either GTB slotted or SRP drilled and slotted configurations.





Frame Coater Kit

KBS Coatings, Valparaiso, Indiana, presents its Ultimate Frame Coater Kit, now with more than 20,000 units sold. Designed for DIYers and professionals looking for an efficient, all-in-one rust-prevention system, the kit includes everything needed to clean, prep and seal frames with a tough, long-lasting finish. It works on bare metal or light surface rust, saving time without compromising durability. An included Cavity Coater with spray wand ensures complete coverage, even in hard-to-reach areas inside the frame.



DashPlay Connected Car Experience

AutoMeter, Sycamore, Illinois, presents its DashPlay Connected Car Experience (9125), an all-new, hands-free multimedia system designed to bring Bluetooth and Wi-Fi-capable smartphone connectivity to most vehicles. Featuring an 8-inch floating touchscreen with an included rearview camera, the DashPlay is built around a compact single-DIN chassis (with double-DIN adapter included) for use in custom builds, restorations and daily drivers. It offers full support for Apple CarPlay and Android Auto.

9-Inch Ford Rear End

Mark Williams Enterprises, Louisville, Colorado, presents its Ultimate 9-Inch Ford Rear End Assembly. The housing is manufactured from an aerospace alloy aluminum and all CNC machining is done in-house. A modular design incorporates a selection of end bells to determine the housing width. Mounts are available for both 4-link and solid installations and offered with either flanged or full-floater axles. It is also available with steel tubes to facilitate street applications.



Ford Truck Instrumentation



Dakota Digital, Sioux Falls, South Dakota, presents its Retrotech Series instrumentation that fits 1992-96 and 1997-2004 Ford truck models. A drop-in upgrade for the Ford truck dash, the RTX series retains the stock look without sacrificing late-model features. The systems incorporate OEM design elements regarding the layout, face styling and indicators, but with a flick of a switch the LED backlighting comes on in a choice of color schemes. CNC machined housings surround high-definition TFT message centers that can be configured to display preferred information.



Multifunctional Chevy K10 Pro1 4x4 Chassis

Total Cost Involved Engineering (TCI), Ontario, California, introduces a multifunctional 1963-87 Chevrolet K10 Pro1 4x4 Chassis designed for off-road use and daily driving. Manufactured with triple-wall frame rails featuring 10-gauge plate steel and fixture welded, the setup includes a front and rear 4-link suspension developed with **Currie Enterprises** and **RockJock 4x4** engineers. The direct-replacement chassis uses a driver-side output Atlas transfer case and includes customizable options including axles, steering, suspension and drivetrain.

Ram Truck Exhaust



AWE, Horsham, Pennsylvania, presents a new Exhaust System for 2025-plus Ram 1500 standard and high-output truck models. The 0FG Exhaust is a pure bolt-on, true dual 3-inch configuration that comes complete with dual 5-inch, double-walled straight-cut tips in choice of chrome silver or diamond black. The system features patented drone-canceling 180 Technology and is handcrafted from CNC mandrel-bent, U.S.-sourced 0.065-inch-wall T304L stainless steel. A bespoke X-pipe delivers a refined, rasp-free tone.

BMW M5 Exhaust



Akrapovič, Horsham, Pennsylvania, presents its line of Exhaust Products for BMW's latest generation of the M5: the G90 sedan and G99 wagon. The Evolution Line full-titanium exhaust system saves 35 pounds compared to the stock system while increasing power output by 7 hp and torque by 17 pound-feet without remapping the ECU. The signature sound results from an increased tube diameter and is refined by an added resonator, cast titanium X-pipe and acoustic reflectors integrated into the exhaust tips. ***TS***

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T-5



TKX



MAGNUM-XL-F



TR-4050

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Roller Rockers & Lifters p. 34 / Engine Products p. 40

Performance Roller Rockers & Lifters, Part I

Understanding the term 'rollers' & the advantages they offer.

BUILD, TEXT AND PHOTOS BY MIKE MAVRIGIAN



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. He can be reached at 330-435-6347 or birchwdag@frontier.com. Visit Birchwood's website at birchwoodautomotive.com.

EDITOR'S NOTE: *This is the first in a two-part series exploring the features and benefits of roller rockers and lifters.*

Friction is one of the demons that engine builders strive to reduce. Here we'll discuss the role and advantages of roller rocker arms and, next time, roller lifters, including application differences.

"Conventional" rocker arms pivot on a "ball" that requires lubrication to prevent metal-to-metal contact (or a bushing when rockers are shaft-mounted). The rocker arm tip rides/slides on the valve stem tip. Although the contact points are provided a level of lubrication, long-term wear is inevitable, and the friction at these two points serves to generate heat and somewhat limits valvetrain efficiency in terms of stability during sustained high engine speeds.

Utilizing roller rockers reduces friction and enhances valvetrain efficiency, allowing the use of more aggressive cam profiles.

When we discuss roller rockers, there are two basic types: those that feature needle bearings at the pivot point but retain a conventional rocker arm tip (common in many OE engines) and those that feature a "full" roller design, including both roller bearings or bushings at the pivot, but also with a roller bearing "wheel" at the rocker arm tip (common in aftermarket performance rockers).

Roller rockers may be used in conjunction with either a flat tappet camshaft or a roller camshaft, and it's important to understand that "roller" rockers and "roller" lifters are two separate applications.

Lifter design is based on the type of cam being used. Flat tappet cams require the use of flat tappet lifters, while roller camshafts require the use of roller lifters. As noted, roller rockers can apply to either flat tappet or roller cam setups.



Hardened lash caps provide protection for titanium valves to prevent wear on the softer titanium material. Lash caps are also available in varying thicknesses and can be used to alter valve stem overall height when fine-tuning rocker arm geometry in combination with pushrod length.

FULL ROLLER ROCKERS

This term refers to rockers that feature both a needle bearing trunnion pivot and a roller wheel for valve tip contact. Full roller rocker arms reduce friction and provide a more accurate means of valve control and stability as opposed to factory rockers that feature a friction-laden pivot and rubbing friction between the rocker and the valve.

A full-roller rocker may be stud-mounted to the head or pivots on a rocker arm shaft, wherein the shaft is bolted to the cylinder head with the rocker bearing pivoting on the secured shaft. The reduction of friction should be obvious. Full-roller rocker types include forged or billet aluminum or tempered steel, in a variety of shapes, weights and arm ratios.

When encountering 18-degree or shallower valve angles and the use of larger-diameter valves, it's common to require the use of offset rocker arms to maintain rocker arm alignment to the valves and pushrods. The rocker arm offsets will be determined by the specific cylinder head manufacturer.

In one example, a set of Trick Flow 18-degree Chevy heads will require an exhaust rocker arm offset of 0.220-inch and an intake rocker arm offset of 0.550-inch when using Jesel rocker arms. Cylinder head manufacturers will usually recommend one or more specific rocker arm brands as

well as offsets to properly accommodate their heads.

SHAFT-MOUNTED ROCKERS

High-performance roller rocker arms are available in stud-mount or shaft-mount offerings. In the early days, stud-mount rockers pivoted via a ball-and-socket design. As higher performance requirements were needed, aluminum and steel rockers that pivoted on needle roller bearings were employed.

As development progressed, a roller bearing was added to the rocker's valve tip. With more aggressive cams, higher engine speeds and increased loads, stiffer materials were employed and various geometric rocker arm shapes were developed.

The next step was to offer shaft-mounted rockers. Instead of each rocker pivoting at a single stud, a horizontal shaft serves as the fulcrum point, which greatly increases both mounting stiffness and valvetrain stability. Since the rockers pivot on a common shaft, this prevents the rockers from individually deviating from the axis of the valve, which results in superior rocker-to-valve and rocker-to-pushrod stability.

Stability is optimized since the rockers can only pivot on their shafts and can't move laterally across the valve tips. Also, each shaft secures to the head with multiple bolts, providing a stronger, more stable mounting platform ideal for high engine speeds and loads.



When checking rocker arm installed height and pushrod length, paint the valve tip with a marker. With a light checking valve spring inserted and the rocker and pushrod installed, rotate the crank and cam to create a rocker arm sweep witness mark.





The witness mark where the rocker arm roller wheel sweeps across the valve should be narrow and centered. If the mark is biased inward toward the intake side of the head, the pushrod is too short. If the mark is biased outside toward the exhaust, the pushrod is too long.



OEM LS rockers feature a cast pivot trunnion and needle bearings housed in cups. Since the needle bearings are uncaged, if either end cap loosens, the needle bearings will dislodge and scatter, which is a concern during sustained high engine speeds.



If OE-type rockers are to be used, a trunnion upgrade kit is strongly recommended.



A trunnion upgrade kit features strong steel trunnions and fully caged bearings.



A circlip at each end of the trunnion provides secure retention for the bearings.



Note the rocker-arm-valve-tip-to-pushrod offset on these Jesel roller rockers mounted to an 18-degree cylinder head. The intake (at left) shows a noticeable offset, readily visible by the staggered position of the ends. The exhaust rocker's shaft bore angle provides a slight offset, with the valve tip roller angled to align in plane with the valve tip.



An example of offset rockers required for use with an 18-degree cylinder head, where the intake rocker is offset by 0.550 inch and the exhaust rocker is offset by 0.220 inch. Depending upon the brand and model of cylinder head's valve placement, the need for rocker offsets varies.

ROCKER ARM MATERIALS

Aftermarket performance roller rocker arms may consist of precision-cast stainless steel, forged or high-temper aluminum, chromoly steel or other steel alloy materials.

Aluminum requires a thicker design as compared to steel in order to maintain required strength. "Lightened" steel rockers can be made using reduced dimensional mass to approach the lighter weight of aluminum. Although generally heavier, they can be designed to achieve the same moment of inertia as aluminum.

The goal is to use rockers that suit the specific application. The higher the spring pressures, the stronger the rocker and its mounting platform needs to be. For all-around performance and racing use, aluminum rockers are available for just about anything you plan to build.

If you plan to run endurance races where 8,000-9,000 rpm are the norm, high-strength steel may be the better choice. Variables to consider include the manufacturer and series of rockers each maker offers—since some are stout and full-bodied and some are lightened and feature strengthening ribs—and the differing quality and design of bearings and trunnions (rocker arm axles).

Note that some OE engines, such as the GM line of LS-format engines, utilize rocker arms that feature needle bearings at the pivot and nonroller tips. The OE rockers are fitted with uncaged needle bearings. These have been known to fail under high valvetrain loads and high engine speeds, resulting in the needle bearings releasing and scattering throughout the engine.

If using OE rocker arms, it is highly recommended to upgrade the trunnions with caged bearings that are retained with clips. These trunnion upgrade kits are readily available from sources such as COMP Cams.

ROCKER ARM RATIO

Rocker arm ratio refers to the comparison of two pivot point distances—the distance between the centerline of the rocker arm pivot (the trunnion bearing, where the rocker rides on its shaft or stud pivot) and the centerline of the rocker arm's roller tip, where it meets the valve stem tip, compared to the distance from the pivot centerline to the pushrod cup.

The distance between the pivot centerline and the pushrod cup centerline is referred to as distance X. The distance from the pivot centerline and the roller tip is distance Y. Distance Y is also referred to as the rocker arm's pivot length (more on that later).

Ratio is determined by dividing distance Y by distance X.

For example, if distance X (pivot center to pushrod cup center) is 1 inch, and distance Y (pivot center to roller tip center) is 1.5 inches, Y divided by X is 1.5 inches, in which case this rocker arm has a ratio of 1.5:1. As another example, if Y = 1.620 inches and X = 1.01 inches, the ratio would be 1.6039:1.

When you increase arm ratio, the distance from the rocker arm pivot to the roller valve tip does not change. This is a "fixed" distance referred to as the pivot length in order to suit the specific cylinder head, since the location of the valve stem remains constant.

When ratio is increased, the distance from the rocker arm pivot to the pushrod adjuster cup (X) is the dimension that changes, decreasing the length of the X dimension. This slightly changes the angle of the pushrod, moving the upper end of the pushrod outboard, closer to the valve spring.

Effective valve list increases when rocker arm ratio is increased. By knowing the camshaft's lobe lift, we multiply lobe lift by rocker arm ratio to determine effective valve lift.

If the lobe lift on the cam is, say, 0.432 inch, using a small-block Chevy standard arm ratio of 1.5:1, 0.432 inch x 1.5 = 0.648-inch valve lift. If we increase arm ratio to 1.6:1, by multiplying 0.432 inch x 1.6:1, we increase valve lift to 0.6912 inch. So, rather than changing the cam, we can "cheat" by changing to a higher ratio rocker arm.

You can also determine the change in lift by referring to the cam's published valve lift. Divide the known valve lift by the existing rocker arm ratio, which will reveal the camshaft's lobe lift. Then multiply the lobe lift by the proposed higher rocker arm ratio to determine the new valve lift.

For example, if the known valve lift is 0.5 inch and the existing rocker arms have a



Aluminum rocker arms, such as the Harland Sharp rollers shown here, are available with pairs riding on common axles to eliminate any wiggle.



While aluminum provides reduced weight compared to steel, aluminum arms require more mass to provide required strength.

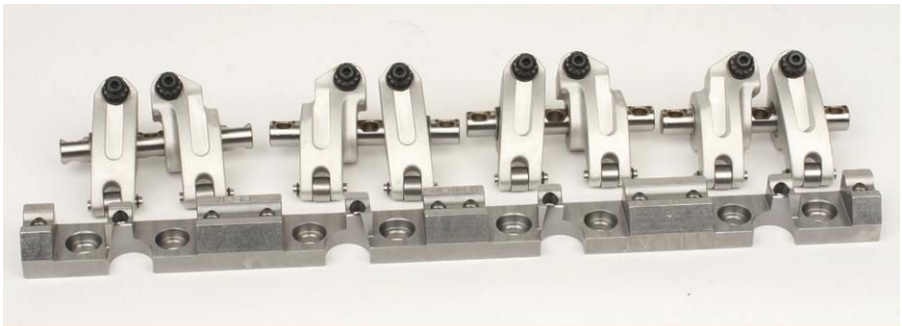


High-quality roller rocker arm manufacturers use high-strength steel trunnions and caged needle bearings to provide durable and stable rocker arm motion, such as found on this Harland Sharp rocker.



Ultra-strong shaft-mount steel rockers are available as an alternative to aluminum. (Photo courtesy Jesel)





Depending on the specific cylinder heads, shaft-mounted roller rockers may require stands that accept the rocker arm shafts and hold all arms in plane, and at the specified height required for proper rocker arm geometry. The stands bolt directly to the heads.



Rocker arm shaft axles are hardened steel, riding on precision needle bearings.



Pushrod cups are hard steel and coated for lubricity.



Note the slight undercut relief under the valve tip on this Jesel aluminum rocker. This provides additional clearance for the valve spring retainer.



Steel rocker arms are available in designs that remove unneeded material while maintaining strength. Shown here are Jesel rocker arms during early initial production featuring CNC slight removal of side material and skeletonizing.

ratio of 1.5, 0.5 divided by 1.5 shows a cam lobe lift of 0.333 inch. If you're considering moving to a 1.6:1 rocker arm, multiply the 0.333 lobe lift by 1.6, which results in a new valve lift of 0.5328 inch.

The majority of aftermarket performance roller rocker arms are stamped or laser etched to identify the ratio, so there's no need to actually measure the rocker arm (although hand measuring the arm's two pivot distances using a dial caliper will allow you to obtain an approximate ratio).

While increasing rocker arm ratio allows you to obtain a greater valve lift, there are other factors to consider. Since the higher-ratio rocker arm will be longer, you potentially run the risk of increased valve guide wear if you don't pay attention to pushrod length.

Altering arm ratio will potentially require a different pushrod length, or the rocker arm may need to be raised or lowered to achieve proper geometry. When setting up the valvetrain, it's always critical to measure for proper pushrod length.

Another element to consider is the valve spring. Since the higher-ratio rocker arm will open the valves wider, you may need to upgrade to stiffer valve springs or springs that provide additional coil clearance in order to avoid spring bind under full lift, since an increase in rocker arm ratio will compress the spring farther during the full valve open event.

While roller-tipped rocker arms provide a reduction of friction at the valve stem tip, attention must be paid to the valve material. If valves are made of a softer valve material such as titanium, a harder surface is required at the valve tip to avoid high spring pressure forcing the rocker arm wheel from digging into the valve.

While some titanium valves feature a hard coating, common practice involves the use of hard steel lash caps. Lash caps are available in various thicknesses to also allow fine-tuning of pushrod length. If lash caps are to be installed, they must be in place during pushrod length measuring.

Whenever you're attempting to determine pushrod length, as well as shaft-mounted rockers that feature bolt-on stands, it's best to first install light checking springs. Clean the valve stem tips to remove any oil and apply a black magic marker to the valve tips (or lash caps). This will provide a witness mark regarding how the rocker contacts the valve stem tip.

Slowly rotate the crank and cam, turning the crank a full 360 degrees. Remove the rockers and inspect the witness mark made by the roller tip, which is the rocker sweep pattern. The witness mark should be narrow and centered on the valve tip.

If the mark is biased toward the intake side of the head, the pushrod is too short or the rocker arm stand needs to be lowered. If the witness mark is biased toward the exhaust side, the pushrod is too long, or the rocker arm stand needs to be raised using shims.

On shaft-mount rocker systems that feature a mounting stand, rocker stand height will influence the rocker-arm-to-valve sweep location.

Next time we'll take a look at roller lifters. **TS**

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ORANGETOP QH6 Lithium Battery

OPTIMA Batteries, Milwaukee, presents its new ORANGETOP QH6 lithium battery. Designed to offer increased performance with more cold cranking power than a standard H6, the battery resists extreme temperatures with added durability and weight reduction. QH6 is a quad-terminal, 45 Ah battery with a cranking power of 880 A and a weight of 19.8 pounds. Features include OPTIMA CPR built-in jump-start and the integrated OPTIMA Batteries Bluetooth app.

Godzilla Piston Kit



MAHLE Motorsport, Fletcher, North Carolina, introduces a Flat Top POWERPAK Piston Kit for Ford Godzilla 7.3L engines. Including forged pistons, rings, pins and clips, the kit is engineered to exacting tolerances with pistons forged from 2618 alloy to deliver a 12:1 compression ratio. The POWERPAK pistons feature a flat top with valve reliefs and are available in 4.221-inch stock bore size or overbore sizes of 4.225 inches. Kits comes complete with HV385 coated steel 1.0mm top rings, 1.0mm second rings and 2.0mm oil ring sets.



Mopar LA Engine Cylinder Heads

AFR (Air Flow Research), Valencia, California, presents its new 175cc Small-Block Mopar Cylinder Heads, engineered for 1964-92 Chrysler 318, 340 and 360 LA engines. Featuring precision-designed intake and exhaust runners with an as-cast finish, the heads deliver optimized flow and consistent performance straight out of the box. Redesigned water jackets provide improved cooling in high-stress areas, enhancing durability and reliability under demanding conditions.

388mm Fuel Pump



DeatschWerks, Oklahoma City, presents its Compact 38mm Fuel Pump that reaches 430 lph with optimized pump technology. Featuring an optimum impeller blade count and angle for peak efficiency at the target flow rate and advanced carbon matrix commutators for increased durability in E85 and race fuels, the pump is engineered to eliminate turbulence and reduce restrictions. Digitally balanced armature extends bearing life and decreases NVH, while an integrated check valve keeps the fuel system pressurized and avoids hard starts.



Diesel Injector Flush

Hot Shot's Secret, Mt. Gilead, Ohio, presents Diesel Injector Flush, the latest entry into its lineup of diesel additive solutions. A concentrated flush that quickly and safely cleans diesel fuel injectors, restoring out-of-spec injector balance rates, it is formulated with a high cetane base, along with cleaning and lubricity additives to ensure safe engine operation during the cleaning process. The flush can be used during a fuel filter change as preventative maintenance, or when injectors issues are present.



Magnuson Supercharged LS-Compatible Crate Engines

BluePrint Engines, Kearney, Nebraska, presents new supercharged LS-Compatible Performance Crate Engines. The high-strength LSX-style block offerings feature a Magnuson 2650 supercharger on both 376- and 427-ci configurations for power and reliability. The 376-ci engine produces 700-plus hp while the 427-ci crate engine delivers more than 800 hp. Both are designed for seamless plug-and-play compatibility with **Holley**'s Terminator X EFI systems.

Custom Size Valve/Retainer Packages



SI Valves, Simi Valley, California, presents its expanded inventory of Valve "Blanks," including a wide range of stem sizes from 5.5mm to 9mm in both premium stainless steel and Inconel alloys. To complement the custom valve stem sizes, SI offers matching valve guides. They are manufactured in-house from a proprietary manganese-bronze alloy that is fortified to enhance wear characteristics and has high heat transfer capabilities. Compatible with all contemporary valve stem finishes, they are available for a variety of domestic and import applications.



IMCA Modified Spec Racing Engine

Speedway Motors, Lincoln, Nebraska, presents a new IMCA Modified Spec Racing Engine. Designed for more power and torque than a GM 604 crate while maintaining drivability, the kits include a low-maintenance hydraulic roller cam. The unsealed engines give racers the freedom of maintenance, and the Modifieds can run the same spoiler.

E-Mobility Dyno Testing



Mustang Advanced Engineering (MAE), Twinsburg, Ohio, introduces customized E-Mobility Testing Solutions based on its MAE-AWD-500-AC/EC chassis dynamometer. Partnering with **Rivian Automotive** in Irvine, California, a recent project involved three chassis dynamometers for SUVs and trucks, two dynamometers for electric delivery vans (EDVs) and one chassis dynamometer incorporated into an environmental chamber to conduct testing at extreme cold temperatures. MAE provides sophisticated test stands specifically designed for EV drivetrains.



Smaller Bolt Sizes

ARP, Ventura, California, presents smaller #10-32, #10-24 and new #8-32 sizes of its polished stainless steel bolts. Available in 5-packs by size, the selection includes the new #8-32 bolts that feature 12-point heads and are available in 10 0.125-inch incremental sizes ranging from 0.375-inch to 1.500-inch under-head lengths. Designed for a variety of tasks in a vehicle's engine compartment, interior and elsewhere, the fasteners are offered in polished stainless steel or black oxide-finished 8740 chromoly and nominally rated at 180,000 psi tensile strength. ***TS***

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Today's versatile cargo-carrying solutions allow shops to sell a vision instead of a component. (Photo courtesy Küat)

OFF-ROAD WRAP-UP

Recent trends from on & off the trail.

CREATIVE DESIGNS DRIVE TODAY'S CARGO SOLUTIONS

By Jef White

It used to be enough to simply haul your gear to the campsite or jobsite, but no longer. Suppliers are seeing a shift in consumer mindset when it comes to cargo-carrying solutions—from function-only to form and function.

Clever, attractive designs and unique features are adding versatility and an upgraded aesthetic to today's hardworking vehicles.

"Today's truck and SUV owners expect more than basic utility. They want gear that matches the quality and styling of their vehicle—modular, sleek and purpose-built," says Craig Metcalf, automotive manager for Küat. "That expectation is pushing dealers to move away from generic bolt-ons and toward premium solutions like our DEK and IBEX that meet both performance and design standards."

Today's roof racks and toolboxes offer styling and design cues that help incorporate them into the vehicle's overall design.

"Too many shops try to sell cargo solutions as one-size-fits-all. But when dealers fail to educate customers on the integrated design and upgrade paths, they leave money on the table," Metcalf explains.

Westin Automotive offers its Brute Topsider toolbox that mounts to the truck's side bed rails for improved efficiency and convenience. Tony Savasta, vice president of marketing, explains that when shops carry quality systems, they can meet each customer's unique cargo-carrying needs with customized options based on driver and vehicle requirements.

"Make sure you understand the type of truck—two-wheel drive or four-wheel drive, plus ride height, bed length, truck bed box type, etc., and talk with the customer in detail about how they want to load the toolbox, the type of products or tools they are going to store in them, the frequency of the access and their own physical abilities," he suggests. "Frequency is another consideration—if they are going to be in and out of it all day long, the position of the toolbox and the configuration of the storage space matter a lot, so be sure to discuss all these points in detail."

Hardworking folks in all areas of the country rely on quality toolboxes with custom features to get the job done right.

"Fleet and farm customers are driving a surge in toolbox and fuel tank combo sales," notes Kristi Feeney, director of marketing – automotive for Lippert/UWS. "The challenge?



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CARGO SOLUTIONS

■ **HOT PRODUCT:**
Küat DEK Roof Rack
■ **FEATURES & BENEFITS:**
An answer for evolving cargo needs; purpose-built roof rack designed in partnership with Diode Dynamics; built with extruded aluminum; engineered T-slot channels; fully modular design; premium fit and finish; made for modern trucks.

Küat
Craig Metcalf
Automotive Manager

■ **HOT PRODUCTS:**
UWS Pushbutton Crossover Boxes
■ **FEATURES & BENEFITS:**
Tough, brand-new, premium boxes built with patented RigidCore foam-filled lids; rock-solid and won't warp under pressure; QuickStrike push-button opens with one tap, ready for action, then locks down tight to keep tools safe and secure.

Lippert/UWS
Kristi Feeney
Director of Marketing – Automotive

■ **HOT PRODUCT:**
Westin Brute Topsider Toolbox
■ **FEATURES & BENEFITS:**
Mounts to the truck's side bed rails; includes open storage space, drawers and organizer options; available in multiple lengths; allows the truck bed floor area to remain open; built in the USA from heavy-duty aluminum; stainless steel T-handles.

Westin Automotive Inc.
Tony Savasta
VP Marketing







Folks in all areas rely on quality toolboxes with custom features to get the job done right. (Photos courtesy Lippert/UWS)



When shops carry quality systems, they can meet each customer's unique cargo-carrying needs with customized options based on driver and vehicle requirements. (Photo courtesy Westin Automotive Inc.

Tonneau covers. They can crowd out toolbox space, but that's where our tonneau-friendly boxes step in, giving customers the best of both worlds without compromise."

A SYSTEMATIC APPROACH

Shops can find success selling cargo-carrying solutions by taking a systematic approach.

"Customers are more likely to invest when they see the full potential. For instance, pairing our DEK roof rack with the IBEX bed rack and showing lighting, recovery or rooftop tent setups allows dealers to sell a vision instead of a component," Metcalf explains. "This not only boosts cart size, but it also helps you stand out from shops pushing commodity gear. Plus, there are strong margins in premium modular cargo systems. Capitalize on that."

Understanding the quality and features of the cargo solutions a shop offers allows retailers and installers to avoid "getting dragged into a race to the bottom with big-box store pricing," says Feeney.

"You win by selling the difference. Train your crew to talk about UWS's superior build, premium materials and battle-tested features. That's how you win customers who want more than 'good enough.'"

To help with walk-in sales, she suggests placing popular cargo solutions front-and-center in the showroom.

"Inventory is king. Get a display rack in your store and keep crowd-pleasers in stock," she says. "Nothing sells a toolbox like a customer being able to put hands on it right then and there."

Good things happen when you build strong partnerships based on real-world data, says Savasta.

"A truck bed toolbox is a significant investment, and with so many choices, I suggest making a list of the basic toolbox types and going through all of them with your customers, narrowing down to the best possible choice. Your customer will love the consultation and understanding all the options before making their selection. Then, drill down and go through all the benefits, from the added utility, ease of maintenance, the quality of the product's features and the warranty. I would also take a quick video of your toolbox installations and post them on your social media site—you can use them to show to potential new customers."



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AMERICANS CONFIDENT WHEN HEADING OFF-ROAD

American drivers are increasingly confident in their ability to tackle off-road conditions—even as challenging weather remains a key concern, according to the latest Hankook Tire Gauge Index.

With many drivers using the spring and summer months to explore the great outdoors, the latest edition of the Gauge Index explores the interest and preparedness of all-terrain adventurers, even amid challenging driving conditions.

Results show many enthusiasts are itching to take their vehicles off the beaten path. Hankook found that 7 in 10 drivers are interested in trying at least one type of adventurous driving, with off-roading proficiency leading the way as the top recreational driving skill that respondents expressed interest in (34%).

Younger drivers are especially eager—on average, Gen Z, millennial and Gen X drivers combined (85%) say they are most interested in all-terrain adventures. Baby boomers are less adventurous, with nearly half (47%) showing no interest at all in off-road experiences.

HEAD TO THE WOODS

When choosing their ideal all-terrain adventure, forest trails are drivers' top overall pick (31%). Specifically, those living in urban areas are slightly more likely (33%) to want an adventure in the woods than drivers who live in suburban areas (29%).

Regardless of the type of off-roading adventure, drivers know they need to be prepared for anything. Four in 10 drivers (41%) say a spare tire and tools are considered the most essential gear, followed by GPS (25%). Experienced drivers are especially likely to make preparedness a priority, with nearly half (47%) of boomers prioritizing a spare tire and tools as their first choice, compared to just 32% of Gen Z.

Many off-road adventures require drivers to tow something fun behind their vehicles. Camping dominates towing interests, with more than half (59%) of Americans saying they would tow camping gear or use an RV/camper van and tow their vehicle for a road trip. Boomers are more likely to lean toward an RV or camper van (34%), while Gen Z is almost equally likely (33%) to pack camping gear in their car.

Driver confidence also extends to towing skills, with 53% of drivers saying they would be comfortable backing up with a trailer. Nearly as many (48%) are confident backing a boat into the water.

WHEN WEATHER'S A FACTOR

Off-road adventures aren't the only reason to get off the beaten path. Hankook found 61% of drivers are confident their current vehicle could handle off-road driving in an emergency.

Millennials feel especially prepared, with 34% saying they are extremely confident taking their vehicle off-road for an emergency. However, confidence dips depending on the conditions, as nearly a third (32%) say they are least confident driving on icy roads or paths.

This uncertainty is especially pronounced among Gen Z drivers, with at least 4 out of 5 drivers saying they are least confident driving in snowy and icy conditions—lower than any other generation.

An overwhelming 84% of all drivers say they are extremely or somewhat confident driving in rainy weather. Across all drivers, 63% report being somewhat or extremely confident driving in either mud or rocky, rough terrain, despite only 8% reporting their vehicle is equipped with all-terrain or mudding tires.

Interestingly, households with children reported, on average, a 9% higher confidence driving in difficult conditions compared to households without children.

The majority of drivers (45%) say their current car is equipped with all-season tires, making it the most popular choice across all age groups and regions by more than double (21% of drivers have all-weather tires on their vehicle).

When it comes to tire features, more than a third (34%) of drivers prioritize all-condition capabilities such as an industry rating for snow handling, while ride comfort and stability are least important (13%).

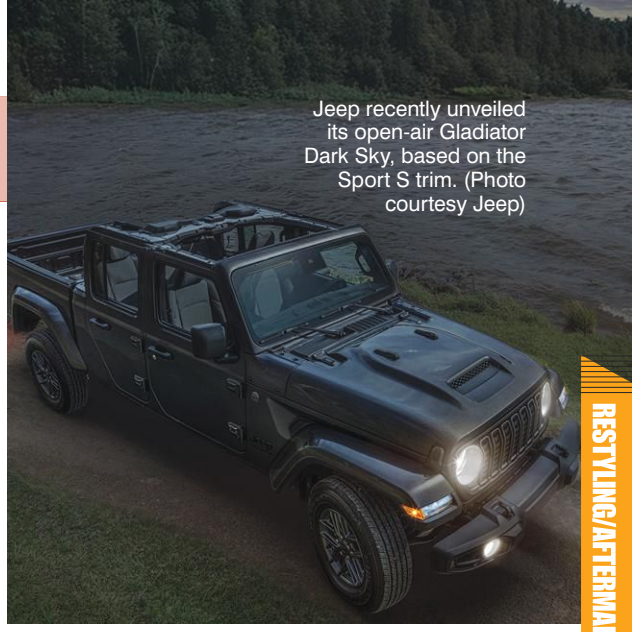
Notably, boomers rank puncture protection as their top priority (38%), more than any other generation.

The Hankook Gauge Index is a survey of Americans' attitudes and opinions about driving. The latest survey was conducted in April, polling 1,000 randomly selected American drivers aged 18 and older.



The latest Hankook Tire Gauge Index finds American drivers are increasingly confident in their off-road driving ability. Of course, vehicles like ECD Automotive Design's "Project Brownie," a Land Rover Station Wagon transformed into an all-season daily driver with the soul of a supercar, make it much easier. (Photo courtesy ECD Automotive Design)

JEEP OPENS UP THE GLADIATOR DARK SKY



Jeep recently unveiled its open-air Gladiator Dark Sky, based on the Sport S trim. (Photo courtesy Jeep)

Jeep recently unveiled its open-air Gladiator Dark Sky, based on the Sport S trim, that provides customers with the ability to equip an optional body-color, hardtop roof. The off-road favorite bundles popular features into one package, including:

- A performance hood to evoke the Desert-rated Mojave styling
- Body-color fender flares
- Gloss black bumper inserts
- Dark-colored badges and decals

With a bundled MSRP of $1,495, the package's standard equipment also includes a 12.3-inch infotainment screen with Uconnect 5, Jeep's suite of active safety equipment including adaptive cruise control and forward collision warning, and a premium wrapped steering wheel.

Gladiator Dark Sky boasts the capability to handle the daily grind around town and tasks off the beaten path thanks to heavy-duty Dana 44 front and rear axles with front axle disconnect, plus transmission and transfer case skid plates and 10 inches of standard ground clearance.

It includes an available 7,700-pound max tow rating and a best-in-class 4x4 payload of 1,725 pounds.

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TOYOTA BACKING EXTERNAL TEAM FOR REBELLE RALLY

Toyota Motor North America will again participate in the upcoming Rebelle Rally, the longest competitive off-road navigation rally in the United States known for featuring all-women two-person teams.

For the first time, Toyota is fielding a team from outside the company while also sending 12 internal team members to compete. Additionally, Toyota is returning as presenting sponsor of the live event webcast for the fourth consecutive year.



Toyota Motor North America will again participate in the upcoming all-women Rebelle Rally. (Photo courtesy Toyota)

For its first-ever external team, Toyota is backing Rachelle Croft—co-founder of XOVERLAND and CEO of The Overland Collective, which includes XOVERLAND, Expedition Portal, Overland Journal and the XOVERLAND Ranch—and her driving partner, Taylor Pawley. Croft and Pawley previously clinched first place overall in the 2019 event.

"We are thrilled to work with Rachelle and Taylor, who have demonstrated their passion for off-roading both on the course and outside of it," says Samantha Barber, senior manager of production engineering at Toyota and a multiyear participant in the Rebelle Rally. "Following their example of pushing boundaries and embracing new challenges is an inspiration to us, and we are excited to see our own engineers join this year's event to test the performance of our vehicles in the tough course of Rebelle Rally."

As the presenting webcast partner, Toyota will help bring the excitement of the 2025 event to fans worldwide through an online live-coverage platform. Rebelle Rally is set for Oct. 8-18, 2025, over a more than 1,500-mile course in the deserts of Nevada and California.

APOCALYPSE MANUFACTURING STARS IN NEW 'TRUCK DYNASTY'





The newest automotive-related occupation-reality series is Discovery Channel's "Truck Dynasty," which premiered in August. (Photos courtesy Truck Dynasty)

The newest automotive-related occupation-reality series is Discovery Channel's "Truck Dynasty," which premiered in August. The show centers on the custom truck creations of Florida's Apocalypse Manufacturing, owned by Joe Ghattas.

A self-made boss known for his bold designs and loyal following that includes hardcore enthusiasts, world-famous rappers, sports superstars and elite supermodels, Ghattas, alongside his wife and co-owner, Ashley, designs, fabricates and sells next-level builds, ranging from an Apocalypse Hellfire with a pull-out mobile kitchen for legendary chef Guy Fieri to an Apocalypse Super Truck with superhero branding for NBA champion Shaquille O'Neal.

With the support of his in-laws, who run sales and marketing for the business, Ghattas is on the brink of breaking through the fiercely competitive marketplace to establish an American auto brand in a category all its own, according to officials from Warner Bros. Discovery Inc.

Apocalypse Manufacturing has a 50,000-square-foot manufacturing facility in Pompano Beach near Fort Lauderdale. Its builds are available through its exclusive retailer, SoFlo Customs, which has three locations—Fort Lauderdale, West Palm Beach and Tampa. Available models include nearly 170 in-stock, fully built vehicles, including the company's signature Juggernaut 6x6.

Throughout the season, "Truck Dynasty" will showcase many of Apocalypse Manufacturing's next-level creations, such as a high-water emergency response vehicle built for fire departments to traverse downed palm trees to a "Boat Truck," an amphibious Jeep that cruises the highway and dives straight into the water. ***TS***



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Sir James A. Ratcliffe formed INEOS Automotive Ltd. to develop his own vehicle, eventually named the INEOS Grenadier 4x4.

A Brief History of the INEOS Grenadier

A vehicle to serve London's off-road community—if there were such a thing.

BY TONY THACKER
PHOTOS COURTESY INEOS



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.

You've heard the one about the entrepreneur who loved his company so much that he bought it; but, have you heard the one about the British entrepreneur who, when allegedly stonewalled by Jaguar Land Rover (JLR), decided to build his own interpretation of the iconic Land Rover Defender?

Sir James A. Ratcliffe was born into a working-class family in England in 1952 and by 2018 was reported to be the richest man in the U.K. His current net worth is estimated at close to $17 billion, even as he's moved his residence to Monaco.

Ratcliffe worked in the oil industry beginning with a short internship at British Petroleum (BP) before moving to Esso and then Courtaulds. In 1989, he joined U.S. private equity group Advent International.

In 1992, Ratcliffe mortgaged his house and formed Inspec with John Hollowood, then purchased BP's chemicals business. In 1998, Ratcliffe established INEOS and purchased Inspec's ethylene oxide facility in Antwerp, Belgium, for $111 million.

More than 20 acquisitions followed and through the last 25 years the petrochemical company has grown, almost beyond explanation—certainly in this space—and the list of products it supplies covers everything we ever use. INEOS currently employs over 26,000 people at nearly 200 sites in some 30 countries.

Besides his love of soccer, Ratcliffe is a bit of an adventurer and enjoys African safaris. In January 2016, when JLR decided to cease production of the Defender after 67 years of production and more than 2 million vehicles built, Ratcliffe tried to persuade them otherwise. Apparently he even tried to buy the Defender design but JLR passed, citing its own new Defender that was in the works.

Well, if you can't join them, beat them. In 2017, Ratcliffe formed INEOS Automotive Ltd. to develop his own vehicle, eventually named the INEOS Grenadier 4x4. Said to be a "spiritual successor" to the Defender, the Grenadier was supposedly named after Ratcliffe's favorite pub, The Grenadier, in Belgravia, London, where he allegedly came up with the idea.

REFINING THE SUV

Originally, the Grenadier was to be assembled in Wales and in September 2019, Ratcliffe said, "The decision to build in the U.K.





The Grenadier was designed by Toby Ecuyer as a Land Rover competitor.

is a significant expression of confidence in British manufacturing, which has always been at the heart of what INEOS stands for."

However, in a surprising about-face, the decision was made to purchase a Mercedes-Benz Smart factory in Hambach near the French-German border and assemble the vehicles there instead. This decision might have been due to the costs associated with importing European-made components that would be subject to import duties into the U.K.

The Grenadier was designed by Brit Toby Ecuyer, who also resides in Monaco where he is known as a luxury yacht designer—he designed two for Ratcliffe—and not a car designer. And maybe that's a good thing.

At the time, Ecuyer said, "We thought, 'Well, we'll replace it (the Defender).' Then we thought, 'Let's build a better one, something that doesn't leak and is comfortable. After all, this isn't 1948.'"

Ratcliffe and Ecuyer worked to incorporate ingenuity into their design. For example: the roof that doubles as a 300-pound-capacity load rack, the ingenious roof tie bars or roping points (that go roughly where the Defender roof windows are), the vertically split rear door, the exposed door hinges and the utility rails along the exteriors of the doors are all examples of their thoughtful collaboration.

Under the hood resides a 3.0L, six-cylinder twin-turbo BMW B58 (the same as a Toyota GR Supra) engine available with either gas or diesel powertrains that includes





Online sleuthing reveals that approximately 8,000 Grenadier 4x4s were sold last year in the U.S.

a ZF 8-speed automatic transmission and a 2-speed mechanical transfer case. The gas engine produces 281 hp and 332 pound-feet of torque, while the diesel offers 245 hp and 406 pound-feet of torque.

Late in 2020, INEOS announced it would work with Korean carmaker Hyundai on a long-term plan to use Hyundai's fuel cell technology for future Grenadier vehicles and to develop a reliable source of hydrogen in Europe. Given Ratcliffe's experience in the chemical industry, that seems a distinct possibility.

MAKING ITS MARK

Since JLR came out with a new Defender in September 2019 (the first complete redesign since 1983), I wondered how the two SUVs compare. The Grenadier takes a more traditional approach with its ladder frame, solid axles and locking hubs, whereas the Defender is said to offer a more comfortable on-road experience due to its unibody construction and independent suspension.

Either way, British jokesters describe these cars as "Chelsea Tractors" because no one in London ever goes off-road.

Dimensionally, the Grenadier measures 191 inches in length, where the Defender is available from 181 to 212 inches. The Defender is wider at 79 inches compared to the Grenadier at 76 inches and shorter at 77 to 79 inches, compared to 81 for the Grenadier.

Looking at its online map, INEOS highlighted 17 dealers across the U.S. as of earlier this year. Calculating a price is difficult because of all the options, etc., but most appear to be in the $80,000 to $100,000 range. The Defender is somewhat cheaper, starting at around $68,000, but can certainly rise well above $120,000 with added features.

Unfortunately, Ollie Marriage of the BBC's "Top Gear" said of the Grenadier: "Too old-fashioned, too slow, too inefficient, too idiosyncratic, not fit for modern life. None of that is wrong. It's a dreadful SUV. It is to the school run what a battle axe is to slicing vegetables: unwieldy, inappropriate and equipped with enough sharp edges to make you put an arm round your children and retreat to safety."

However, Marriage went on to say, "But equally I can't think of any that are better suited to scuffing down green lanes, scrubbing around the back of beyond."

Meanwhile, our friend Mark Vaughn of AutoWeek had this to say. "The Grenadier is great. I've taken it off-road and driven it on the highway and it's a great vehicle except for the steering—that's a deal-breaker. I don't know why they don't just fix it."

Of course, it's hard to determine if the



British jokesters describe these SUVs as "Chelsea Tractors" because no one in London ever goes off-road.



Not known for its power or efficiency, the Grenadier nonetheless offers distinctive styling and a long list of innovative features.

Grenadier has sold well, though indicators are that 2024 production sold out with somewhere between 8,000 and 10,000 units in the U.S. In January 2025, INEOS also introduced a new model, the INEOS Grenadier Quartermaster. Based on the same ladder frame but with a 12-inch longer wheelbase, the extra-cab pickup has a payload of 1,680 pounds and a towing capacity of 7,700 pounds.

There's no doubt that the Grenadier has eaten into the Rover market and will continue to do so. Perhaps they should have sold Ratcliffe the old design from the beginning. ***TS***



Renaissance Restyling

A commitment to diversification keeps shops active & adaptable.



BY JOSH POULSON

Adaptability is one of the restyling industry's greatest strengths. (Photo by Jef White)



Named the 2022-23 SEMA Person of the Year, Josh Poulson is the principal of Auto Additions in Columbus, Ohio, which was named Restyler of the Year, 2012-13. Auto Additions offers a complete line of product upgrades including 12V and appearance packages with a specific focus on the dealership segment. Josh is immediate past-chairman of the SEMA PRO council.

There's never a dull moment in the restyling world and the ever-changing aftermarket.

It has always been a challenge that vehicle models change every four years—sometimes with refreshes in between as well—requiring updated parts that fit the new designs. Then, it seems like when you do find a restyling package or product offering that works well at one of your dealerships, suddenly the general manager or sales manager leaves, and you have to basically start all over with a new person to win the business again.

Such is the life of a restyler—waiting for new vehicle models, then waiting for manufacturers to make the correct accessories, then waiting for a dealership manager to let you put something on that model and then waiting for a customer to buy it.

This is why so many shops over the years have diversified into a variety of different products and services. It isn't because we're bored with our inventory or our offerings—it's because restylers can't survive if they don't diversify.

CONSTANTLY EVOLVING

Looking back over the years, aftermarket products have constantly evolved. Maybe your shop at one time installed vinyl pinstripes, bumpers (OE style when bumpers didn't always come on trucks), moldings, deck racks, simulated convertible tops, gold packages, chrome packages, radios, Bluetooth, auxiliary jacks, fiberglass running boards, pop-up sunroofs and more.

I guarantee if you still do any of these it isn't at the volume you did in the past, and so you've had to diversify into new products and new services. That adaptability is one of our strengths as an industry—the ability to quickly make course changes like a speed boat compared to a large barge, like the OEMs tend to reflect in their slow adoption of accessory trends and offerings.

My columns would be a lot easier to write if I could diversify into simply having artificial intelligence (AI) do the work, as is the trend these days in other markets. But AI has never had to wonder which products or offerings it needs to look for and try to sell to make ends meet.

However, AI was able to help me understand different avenues of diversification for today's restylers. Some of these suggestions are closely related, and an argument could be made to recategorize something I mention. For simplicity's sake, though, here are some examples of ways to diversify:

HORIZONTAL DIVERSIFICATION

It makes sense to first look at expanding into new products or services that are related to your existing offerings.

For example, a shop that does 12V items like remote starts and cruise controls might expand into new 12V offerings like ambient lighting or light bars. Or a film shop that focuses on tint and PPF may add some color-change wraps.

Look to grow your product line with offerings that require little extra work. It is probably the easiest type of diversification because your technicians are already familiar with the installs, your current suppliers may also carry these new products, and your sales and marketing staff has already created effective messaging.

Consider your current accessories and see which "horizontal products" make sense to add.

VERTICAL DIVERSIFICATION

Next comes integrating operations either upstream (toward suppliers) or downstream (toward customers). We see this in our industry when a manufacturer begins to open up shops or installation centers, or when a car dealership tries to install its own accessories.

Over the years I've seen these types of efforts fail more often than they succeed. The idea of diversifying this way looks great on paper, but the execution is much harder than it initially appears.

However, one way for shops to diversify vertically is when they offer their products to other sources, such as when a retail-focused shop starts looking for wholesale customers or vice-versa. Consider ways you can diversify vertically, either upstream or down-

stream—possibly through fleet or municipal partnerships or collaborations with other types of vehicle ownership groups—to bring more sales to your store.

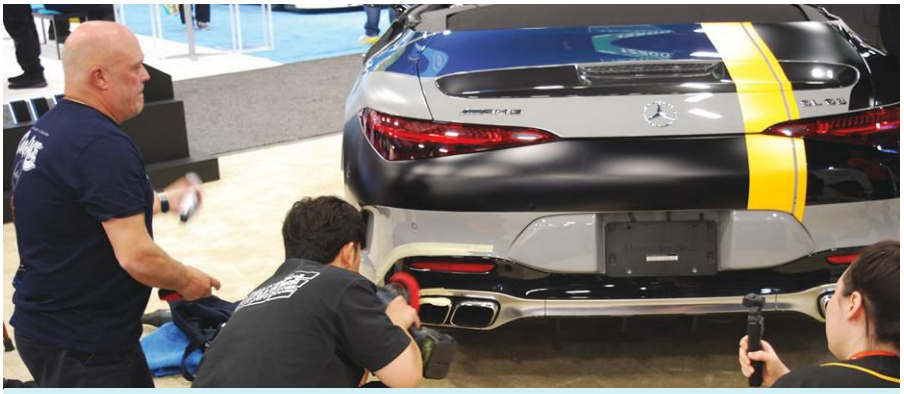
CONCENTRIC DIVERSIFICATION

Concentric diversification involves entering a new business that has technological or marketing synergies with existing lines.

There are a lot of synergies in the automotive field. For instance, some restylers have ventured into providing film products, body and paint work or fleet products, or offering vehicle sales, automotive repair, key replacement, etc.

These are all examples of synergies where a current customer base might look to you for a solution. It takes a good deal of planning before simply jumping into offering a new type of business, however.

Do you have the expertise, personnel, software or tools, understanding of the market and a supplier to all make it work? If so, concentric diversification can be a lucrative way to add on to your business.



Diversification helps shops survive and thrive in an ever-changing marketplace. (Photo by Jef White)

CONGLOMERATE DIVERSIFICATION

Conglomerate diversification is defined as venturing into an entirely unrelated business. This one may not be a big option for many restylers, but a few successful examples come to mind.

For instance, if you are looking for a new building for your shop, have you thought about buying a structure larger than you need and then becoming a landlord by renting out the extra space?

For years, our company owned some land behind our shop and used it as RV/boat storage, which helped with passive, reliable income every month.

I also know of other shops that have started renting cars to individuals—again a totally separate, unrelated business but a way of diversifying for additional income.

Hopefully, at least one of these ideas makes sense for your business as we all wait for that next unexpected market change and prepare to "diver-survive" and thrive! ***TS***





Compact Headrest Safe

The Headrest Safe Co., Homewood, Alabama, presents its all-new Compact Headrest Safe. Made for sedans and luxury vehicles, the Compact is ideal for drivers looking to store personal items discreetly inside their vehicle. Featuring a simple keypad lock to access the door similar to a hotel-style safe lock, the headrest safe's sleek profile provides ample interior room to accommodate valuable items including firearms, cash, identification documents and more.

Off-Road Rack



KC HiLiTES, Flagstaff, Arizona, introduces the Platform One roof rack system. Built for off-roaders, overlanders and general adventurers, the PL1 modular roof rack combines rugged durability, seamless lighting integration and a Power-Ready design for versatility on and off the trail. The system includes KC's overhead Gravity Pro6 or Titan light bars, all-new flush-mount side lights and rear-facing lighting options, paired with a full-length platform, adjustable upper mounting deck, perimeter channels and a complete lineup of purpose-built accessories.

Window Deflectors & Bug Shields



Westin Automotive Products, San Dimas, California, presents its latest Window Deflectors and Bug Shields. Made in the USA to deliver both functionality and a sleek appearance, the deflectors and shields are engineered to provide long-lasting protection while enhancing vehicle style. The window deflectors are manufactured from durable acrylic in tinted or matte black that allows for fresh air circulation in any weather while reducing interior exposure to wind noise, dust and moisture. The bug shields are crafted from high-impact acrylic.

Ranger Raptor Leveling Kit



ICON Vehicle Dynamics, Riverside, California, presents a 2.25-inch-lift Front Coil-Over Spacer Kit, designed as an easy and inexpensive way to lift the front end of 2024-25 Ford Ranger Raptor pickups while keeping the OE coil-over shock assemblies. The system maintains full functionality of the stock electronic shock system with billet aluminum coil-over spacers that provide 2.25 inches of front lift over stock for a more aggressive, level stance and easier fitment of larger, more aggressive wheel and tire combinations.



RV & Van Power Panels

REDARC, Lonsdale, South Australia, presents its REDWORKS QuickFit Power Panels, an all-in-one power system designed to simplify installations for RV and van builders. The panels integrate critical power components like the Manager Alpha, dual TVMS Rogues and all necessary wiring into a single unit. Offering reduced supply chain complexity, inventory demands and labor costs by streamlining production with a preassembled, ready-to-install power management solution, it includes 20x10A outputs, 16 switch inputs and four tank-level inputs.



Jeep Soft Top

Bestop, Broomfield, Colorado, presents its Ascent Soft Top for 2007-18 Jeep Wrangler JK four-door models. Designed to deliver an open-air adventure, the tops are precision-built and engineered for everyday reliability with fastback styling and rugged performance at an affordable price. Easy to install and remove, the Ascent is made from lightweight Black Diamond fabric and includes removable side and rear windows.



Toyota 2-Inch Leveling Kit

Tuff Country EZ Ride Suspension, West Jordan, Utah, presents a new 2-Inch Leveling Kit for 2007-21 Toyota Tundra and 2008-22 Sequoia models. The easy-install kit lifts the front of the vehicle 2 inches, eliminating the factory rake for a level, more aggressive stance. It is made in the USA from billet aluminum and retains the factory struts and ride.

Civic Suspension Kit



Eibach, Corona, California, presents its PRO-KIT Suspension Kit for 2025 Honda Civic Hybrid models that reduces the front and rear height of the vehicle 1 inch. The system's performance springs deliver enhanced ride comfort by lowering the center of gravity, thereby increasing steering response and improving vehicle dynamics for a sportier, more balanced feel. Additionally, the reduced height eliminates excessive ground clearance and fender gap for enhanced aesthetics.



Van Wheels

Van Compass, Rathdrum, Idaho, presents its new line of Van Wheels. Drawing on traditional looks and a timeless, iconic style, each bold wheel design is available in three distinct-but-muted finishes and a 17x8 size with a plus-30mm offset for the Sprinter 2500. The wheels feature a 4,200-pound load rating and offer maximum clearance for most aftermarket big brake kits. Able to fit up to a 12.5-inch-wide tire when paired with the company's 6.3 kit, they provide a wider, more sure-footed stance and proper clearance.





Blue Wrapping Films

Avery Dennison Graphics Solutions, Mentor, Ohio, presents two new blue colors in its Supreme Wrapping Film line—Gloss Park Avenue Blue and Gloss Turquoise Ocean. Designed to offer a sophisticated spectrum of blue-green shades evoking everything from iconic luxury to pristine ocean waves, the new colors have been carefully curated to provide dramatic options for car enthusiasts.

Synthetic Rope Winch



DV8 Offroad, Chandler, Arizona, a **Horsepower Automotive Group** brand, presents the Xtract 12K Synthetic Rope Winch. Developed to offer functionality, style and dependability, the winch features an 80-foot, 12,000-pound-rated synthetic line. A robust, straightforward clutch design enables ease of use and the built-in wireless remote solenoid provides a 150-foot working distance. The compact solenoid box is relocatable, so it can be adjusted or positioned separately to achieve a tight bumper fitment, and a 5-foot chafe guard protects the rope.



LED Light Bars

ORACLE Lighting, Metairie, Louisiana, presents its complete line of LED Light Bars. Created to handle any terrain, from winding switchbacks to wide-open deserts, the adventure-ready bars blend performance and a seamless fit. Designed to fit a variety of Jeep, Ford Bronco, Ram and other off-road rigs without the need for bulky brackets, the purpose-built light bars provide needed illumination while matching the vehicle.

LED Light Kits



Vision X Offroad, Auburn, Washington, presents its 3-Inch Square CG2 Single LED Light Cannon Kits. The powerful, versatile CG2 off-road LED lighting systems are offered in sizes from 3 to 8.7 inches and in a single-LED long distance beam or a multi-LED full beam. Each CG2 is equipped with ultra-bright LEDs that allow drivers to comfortably view terrain, and a new Selective Yellow lens option helps cut through dust, rain, snow and fog to maintain maximum visibility. The LED Light Cannons are compatible with the 25-Lights-In-One Cover system.



Bed Rack Panel Kit

Küat, Springfield, Missouri, introduces its Modular Panel Kit, designed to enhance the functionality and sales potential of the IBEX truck bed rack system. Delivering secure, weather-resistant storage without sacrificing accessibility, the kit is compatible with the existing IBEX frame (sold separately) and offers locking security and modular convenience for a wide range of truck-based applications. The system is available in three configurations: full panel kit, side panels only or top/front/rear panels only.



Tailgate Pad

Fox Factory, El Cajon, California, presents the Mission Tailgate Pad. The adjustable, advanced pad protects the tailgate and allows tonneau covers to fully close and lock. A two-panel, full-coverage design can adjust for almost any height of tailgate, and downtube attachment points are customizable for different bikes. Available for mid- and full-size trucks, the pad features durable PVC tarpaulin on the outside and a micro-brushed inner lining to keep tailgates scratch-free.

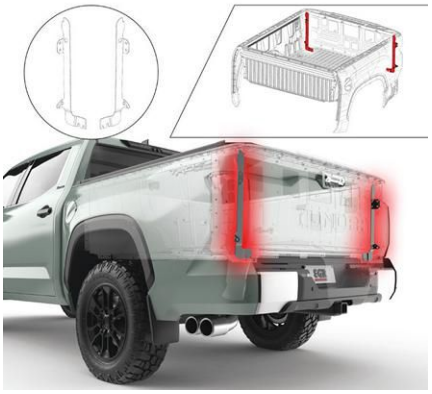


Bronco Adjustable Upper Control Arms

BMR Suspension, Lakeland, Florida, presents Double-Adjustable Upper Control Arms for 2021-25 sixth-gen Ford Bronco models. Created using 1.625-inch DOM steel tubing to add durability and suspension control, the UCAs feature heavy-duty, Teflon-lined rod ends to eliminate bushing deflection. UCA1864 can dramatically reduce upper control arm flex, with a double-adjustable design that allows users to dial in pinion angle. The products are available in red or black hammertone powder-coat finishes.

Tundra Bed Reinforcement

EGR USA, Ontario, California, presents its J-Brace high-strength bed reinforcement solution, available for 2022-newer Toyota Tundra applications. Designed to eliminate bed flex, bounce, misalignment and potential metal fatigue or cracking over time, the J-Brace greatly reduces bed movement and rattling while preventing panel misalignment and uneven gaps. It installs easily and delivers weather-resistant protection with a light-textured powder-coat finish to resist corrosion, rust and harsh weather conditions.





LED Light Bars

RIGID Industries, Gilbert, Arizona, presents new Pre-Assembled Light Bar Additions to its 360-Series lineup. With modular lighting and configurability between straight and curved applications, the new 360-Connect Adjustable Light Bar is designed for a variety of off-road vehicles. The light bar joins the rest of the 360-Series, which currently consists of 4-, 6- and 9-inch circular LED pods. The 360-Connect light bars feature durable billet aluminum construction links that eliminate the need for a center support.



Car Care Chemicals

Malco Automotive, Barberton, Ohio, presents its Car Care Chemicals, made in the USA for more than 70 years. Offerings include the company's Leather & Plastic Cleaner (1001) original detailing formula, designed to easily remove dirt and grime from leather, vinyl and plastic interiors to clean and restore surfaces to a like-new appearance.

Lockable Folding Bed Gate

Leitner Designs, Corona, California, presents the GateKEEPER lockable folding gate for pickups. When paired with the company's Active Cargo System (ACS) FORGED rack system, GateKEEPER secures truck bed contents behind an aluminum barrier, providing outdoor enthusiasts and tradespeople peace of mind. A modular design enables it to be installed on any size of pickup supported in the ACS FORGED lineup. Designed, engineered and manufactured in the USA from 5mm aluminum, the gate weighs 15 pounds and includes a powder-coat finish.





Universal Leaf Spring Bump Stops

RubberShox, Garden Grove, California, presents its Universal Leaf Spring Bump Stops. The bump stops provide essential support for leaf springs by stabilizing the suspension, minimizing sway and improving control when towing or driving with heavy loads. ***TS***

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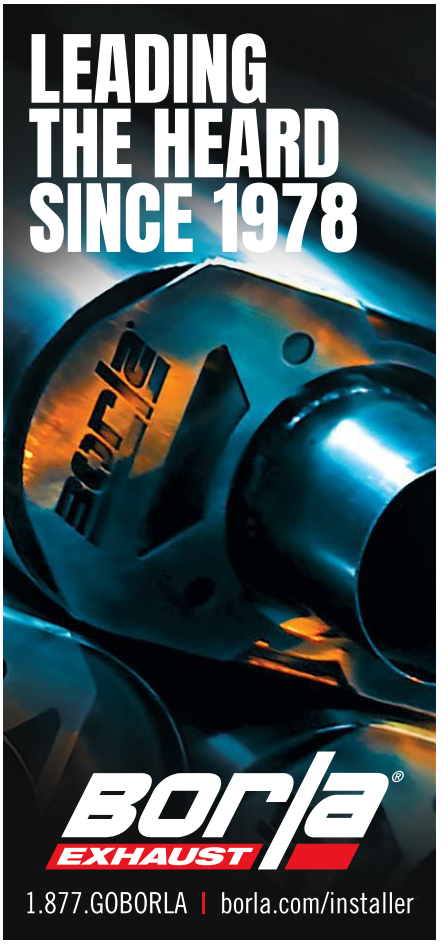


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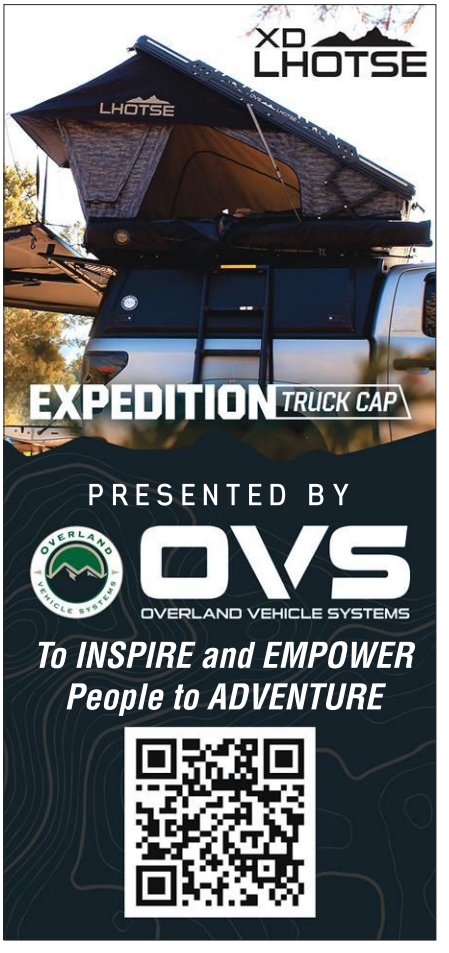
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Drivable Artwork Summers in Sardinia



This summer, Porto Cervo, Sardinia, was home to a special residency of drivable artwork from Hedley Studios. From June 18-Sept. 7, the brand's small-scale autos could be found on the Waterfront, Promenade du Port—an exclusive destination in the heart of Costa Smeralda.

Positioned among a curated mix of prestigious brands such as Riva, Kiton, Technogym, Assouline and Nikki Beach, Hedley Studios offered a display of its flagship creations, providing guests the opportunity to engage directly with the company's celebrated reinterpretations of automotive icons.

Featuring meticulous attention to detail such as customizable leather and paint options available on bespoke Hedley Studios pieces, the display included three scaled models:

- ***Bugatti Baby II***—Developed in close partnership with Bugatti, it's a fully electric tribute to the legendary Type 35. A modern evolution of the original Bugatti Baby, it combines historic beauty with contemporary performance and precision and is designed to be enjoyed as both a drivable piece of automotive legend and an example of supreme automotive art, appreciated by all generations, according to the company.
- ***Ferrari Testa Rossa J***—The 75% scale replica of the revered 1957 250 Testa Rossa was created in collaboration with Ferrari and built entirely by hand. The electric model blends raw racing legacy with luxury materials, capturing the soul of one of Ferrari's most iconic creations.
- ***Bentley Blower Jnr***—Inspired by the 1929 supercharged 4.5L "Blower" Bentley, the reinterpretation pays homage to the daring innovation of the prewar era, reengineered into an electric format that retains its charisma, elegance and mechanical spirit.

The Porto Cervo space was designed to offer both a retail experience and a point of connection—a place where clients and collectors could encounter Hedley Studios' creations in an intimate and dynamic setting, alongside yachts, books, machines and ideas that inspire, says Ben Hedley, CEO and founder of Hedley Studios.

"Porto Cervo represents a natural home for Hedley Studios, where the sea, speed and style intersect," Hedley says. "This space allows us to showcase the soul of our brand to a truly international audience, in an environment that shares our values of elegance, craftsmanship and experience. We're thrilled to bring our carefully designed and engineered pieces of automotive artwork to the picturesque and vibrant locale of Sardinia."

Hedley Studios' limited-edition vehicles are driven by a global clientele and form valuable and treasured collections, celebrating both craftsmanship and expert engineering, Hedley adds.

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

A special residency of "drivable artwork" from Hedley Studios in Porto Cervo, Sardinia, this summer featured smaller-size specialty EVs including the Bugatti Baby II, Ferrari Testa Rossa J and Bentley Blower Jnr. (Photos courtesy Hedley Studios)







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